

THE RAILWAY GAZETTE

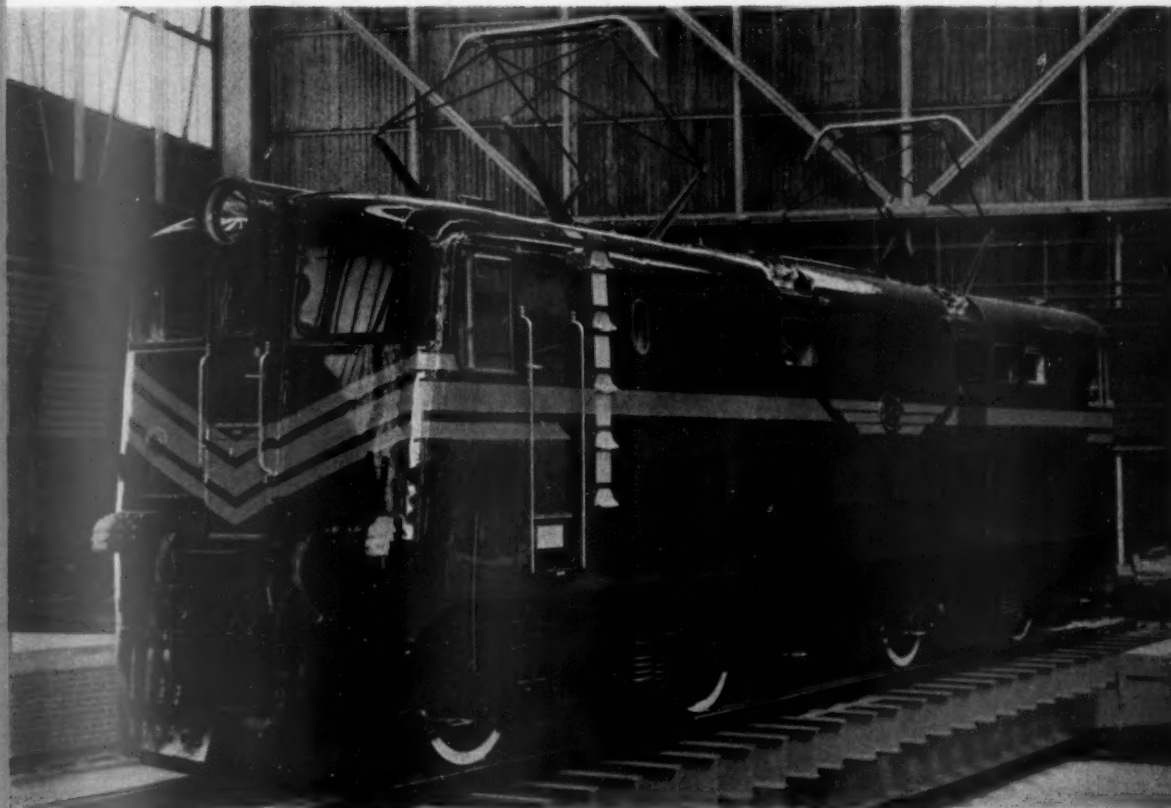
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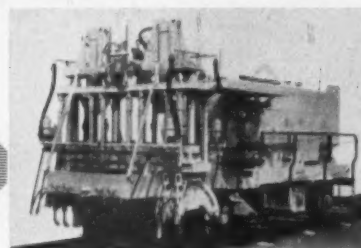
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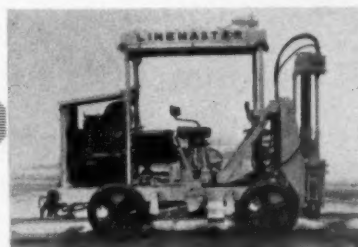
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35

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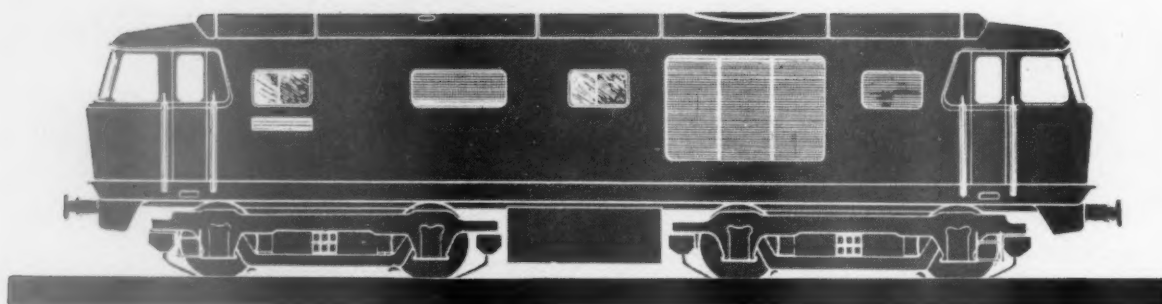


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New order for 50 Bristol Siddeley Maybach diesel engines brings British Railways total to 286



This latest order for 50 Maybach* diesel traction engines, for use in the new Beyer Peacock (Hymek) Ltd Type 3 locomotives, now brings the total orders placed with Bristol Siddeley for British Railways Western Region to 286. These large orders are a striking confirmation of British Railways complete confidence in Maybach high-speed diesel engines.

Maybach Diesels Already In Operation

There are already a large number of Maybach engines in service. Two Maybach Type MD 650 high-speed diesel engines, which develop a total of 2,200 hp, power the D 800 class of locomotive built at the British Railways Swindon works. The famous "Bristolian" express, for example, is hauled by one of these locomotives.

Bristol Siddeley After-Sales Service

Maybach diesel engines have built for themselves, all over the world, an unsurpassed

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For further information, please write to: Maybach Sales Manager, Power Division, Bristol Siddeley Engines Limited, PO Box 17, Coventry, England.

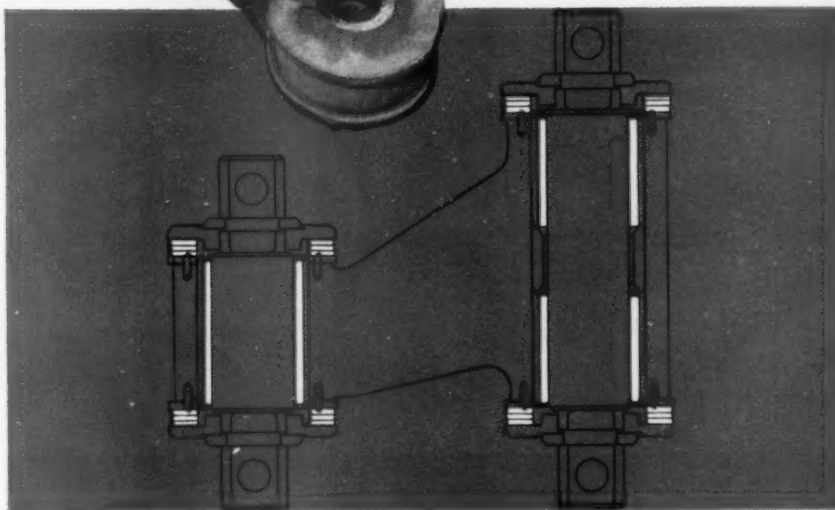
**Manufactured in the U.K. under licence from Maybach-Motorenbau GmbH.*

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ALSTHOM suspensions on BR types 'A' & 'B' a.c. locomotives



The twenty-five 3,300 h.p. Bo-Bo 25 kV a.c. locomotives now being supplied to British Railways by the Associated Electrical Industries Traction Division will incorporate Alsthom radius-arm controlled axle boxes and flexible link wheel drives. SILENTBLOC are proud to be entrusted with the supply of complete radius-arm assemblies comprising Silentbloc bearings, bonded rubber thrust pads and links for the axle boxes, and also complete Silentbloc-bushed links for the flexible wheel drives.



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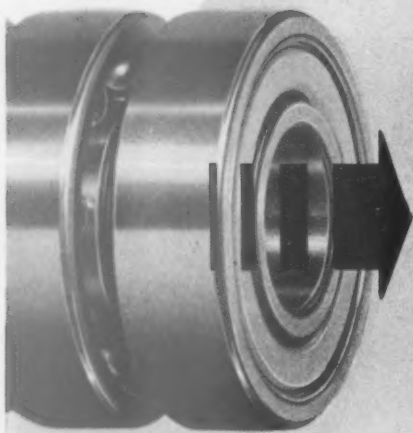
DRAIN ...

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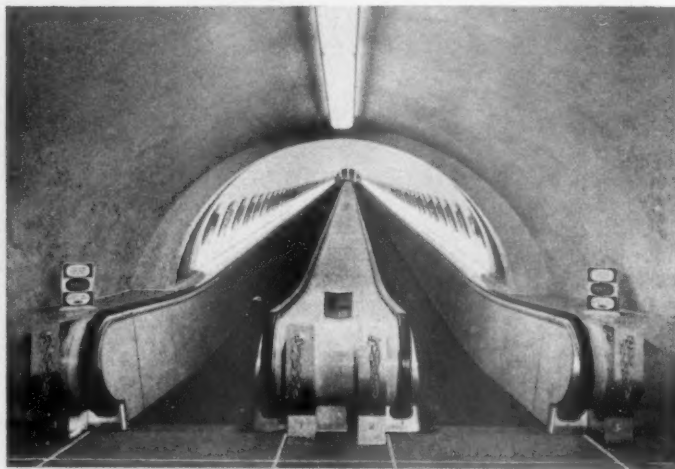
Londoners, journeying to the City call it "The Drain"—the foot-tunnel that leads from The Bank Underground station to the Waterloo and City line. But now tired or hurrying feet need no longer tread its length; they can step upon the Trav-o-lator and be carried all the way.

Manufactured by the Otis Elevator Company Limited, for British Railways, Southern Region, the Trav-o-lator is, in effect, a moving pavement some 313 feet long. It consists of 488 individual, but closely-linked platforms, each of which rides upon four wheels with two Hoffmann bearings fitted to each wheel.

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Straightforward, easy-to-fit Hoffmann bearings with shields to retain lubricant, were specified for this job, to ensure dependability, efficiency and smoothness of movement, the prime features in applications of this nature.



Twin Trav-o-lators viewed from platform level

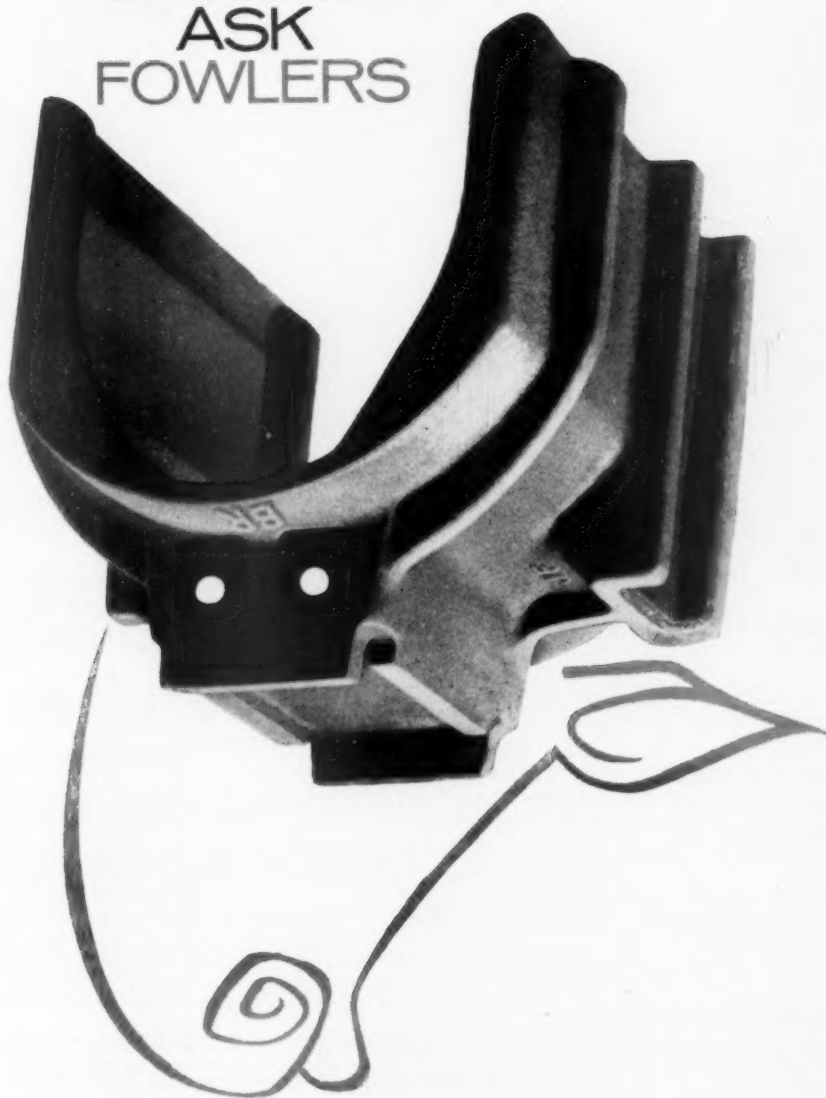
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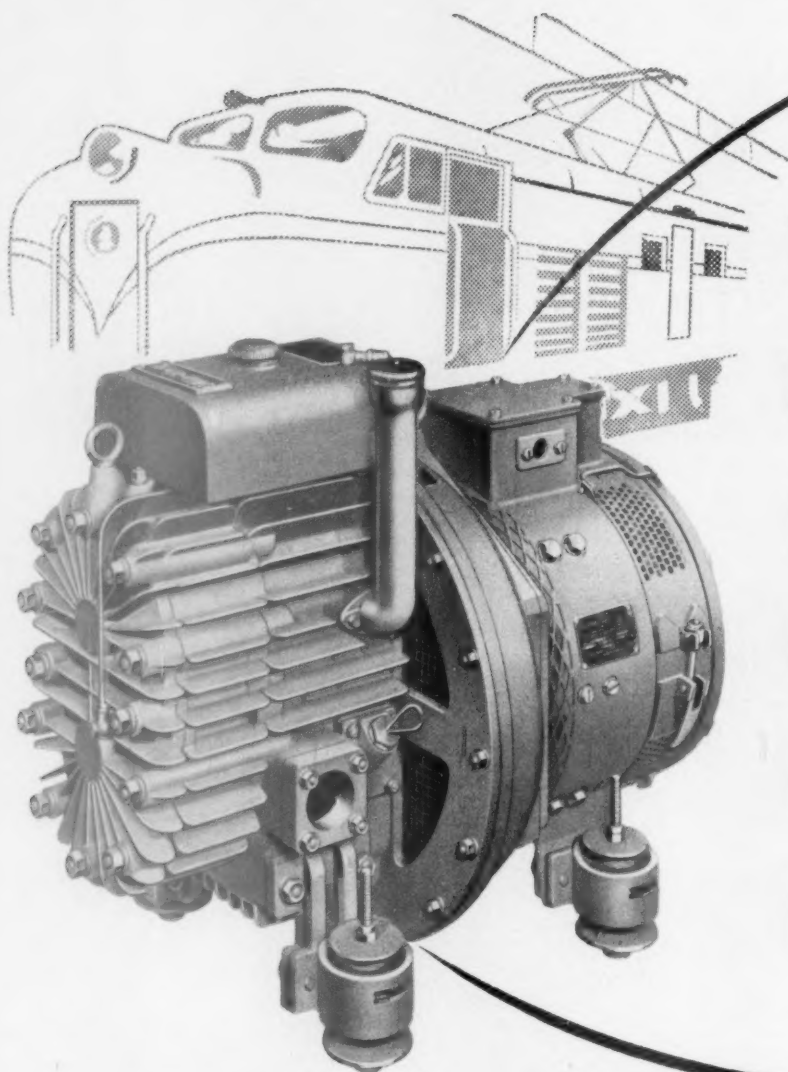
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From the mine site located along the Ogooue River near Franceville in the Gabon Republic, the ore will be hauled 50 miles by cableway to the railhead at M'Binda. There it will be loaded into ore cars for the 300-mile rail trip to the port of Pointe Noire.

General Electric diesel-electric locomotives were chosen to haul heavy ore trains in the extreme African climate for these reasons:

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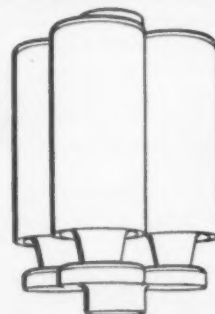
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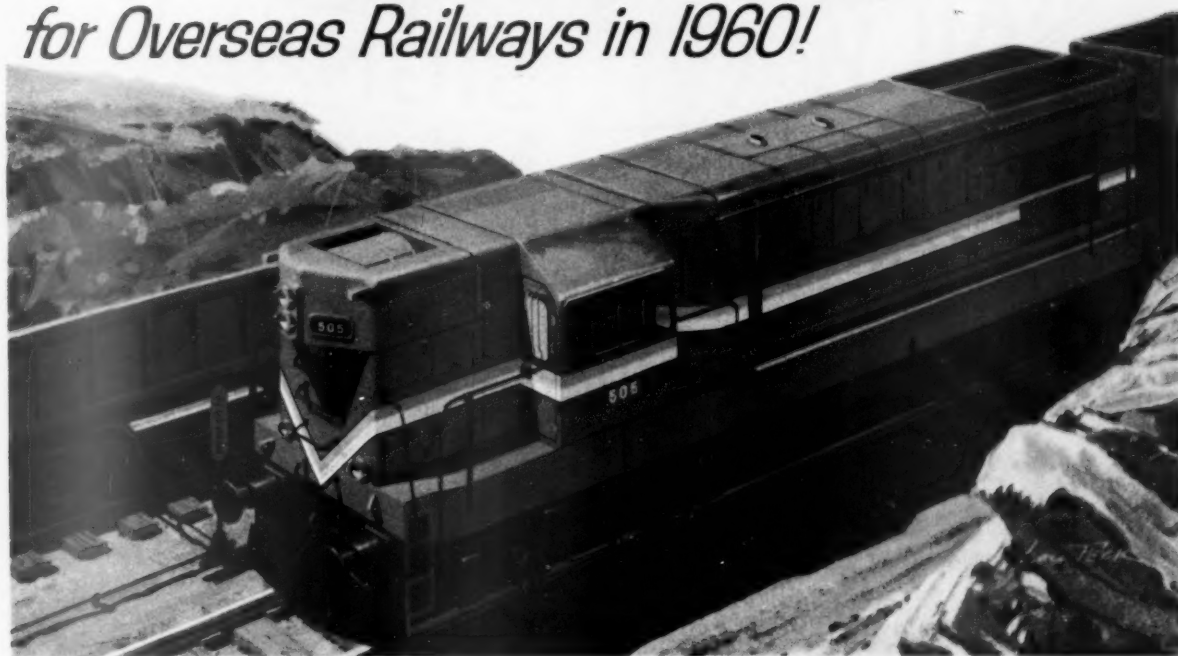


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444^{NEW} GENERAL MOTORS LOCOMOTIVES

for Overseas Railways in 1960!



Recent years have seen a big upswing in the number of General Motors Diesel-Electric locomotives built for overseas railways.

In 1960, a total of 290 overseas units were dispatched by General Motors, plus delivery to our Associate Locomotive Builders of principal components for an additional 154 locomotives. This total of 444 included many repeat orders from satisfied customers. In addition, Ireland, Lebanon and Rhodesia received their first General Motors Locomotives.

This growing acceptance is evidence that railwaymen throughout the world are learning to distinguish between Diesel locomotives. In earlier days, simply the fact that it was a "Diesel-Electric" seemed enough—any Diesel would do more work and at lower cost than a steam engine.

But railways have found there's considerable difference in the various makes of Diesel-Electrics—in the tonnage they will haul, in maintenance

requirements, in total cost of operation. On every count, experience proves that General Motors locomotives deliver superior performance, with higher utilization and lower costs of operation and maintenance. Many railways report at least 10% better return on investment from General Motors locomotives than from other Diesels operating on their lines.

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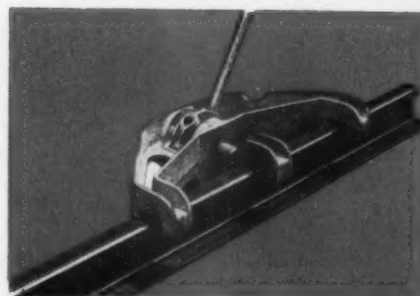




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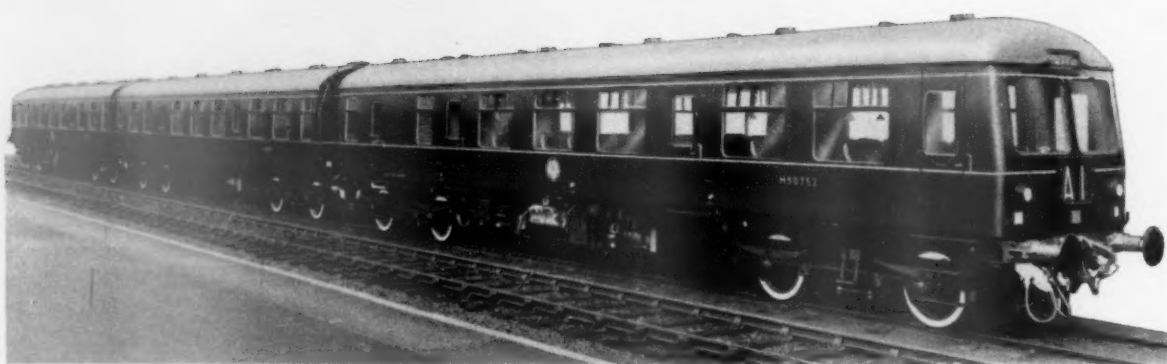
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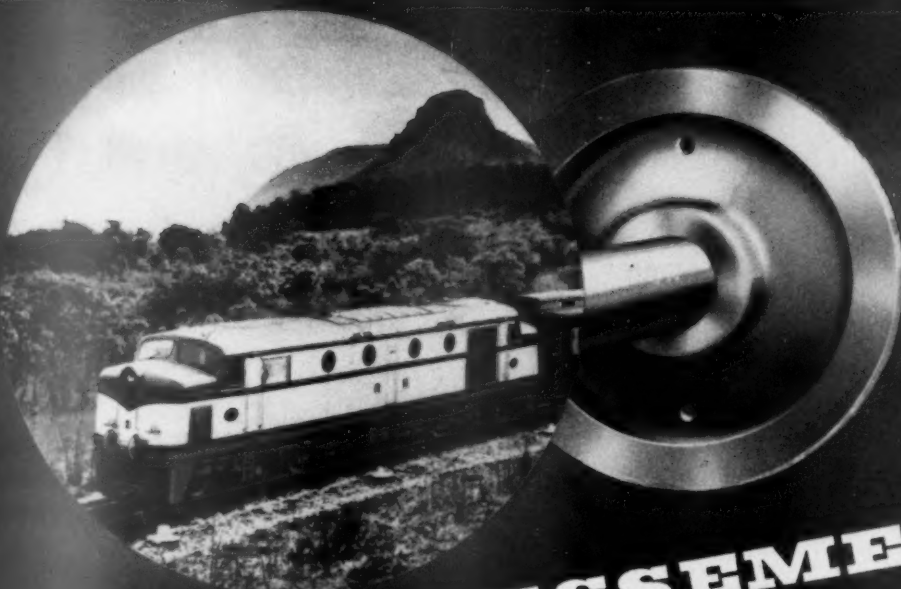
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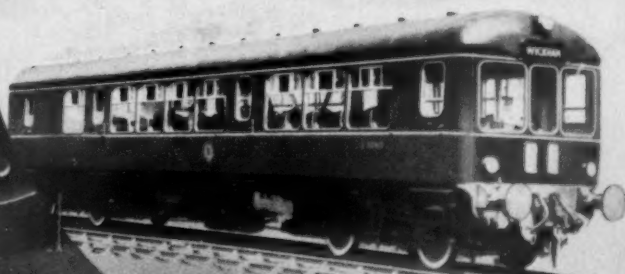
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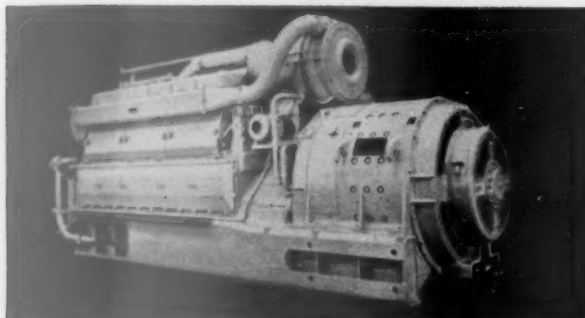
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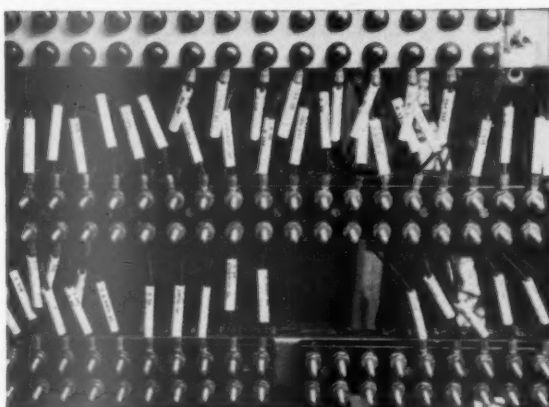
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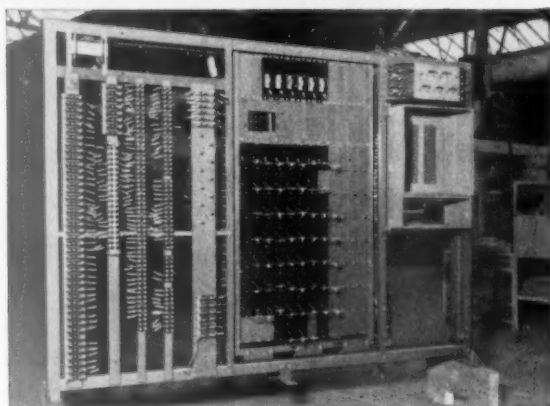


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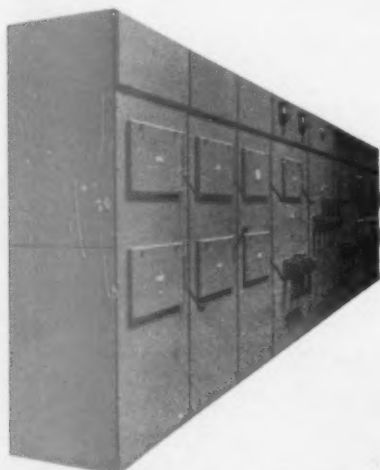
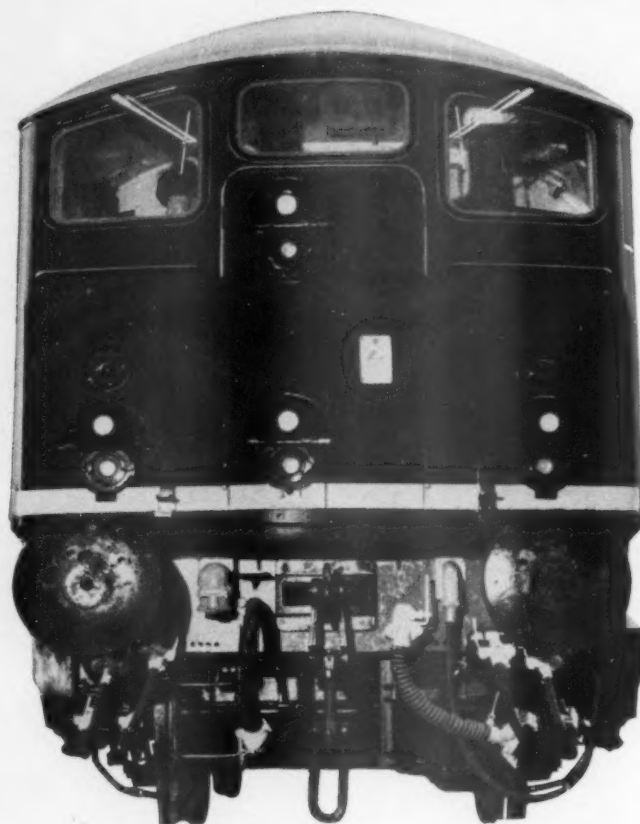
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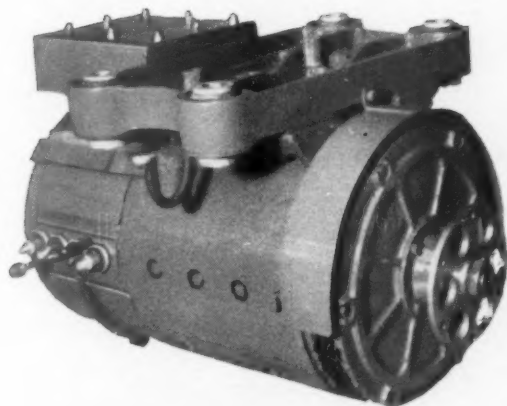


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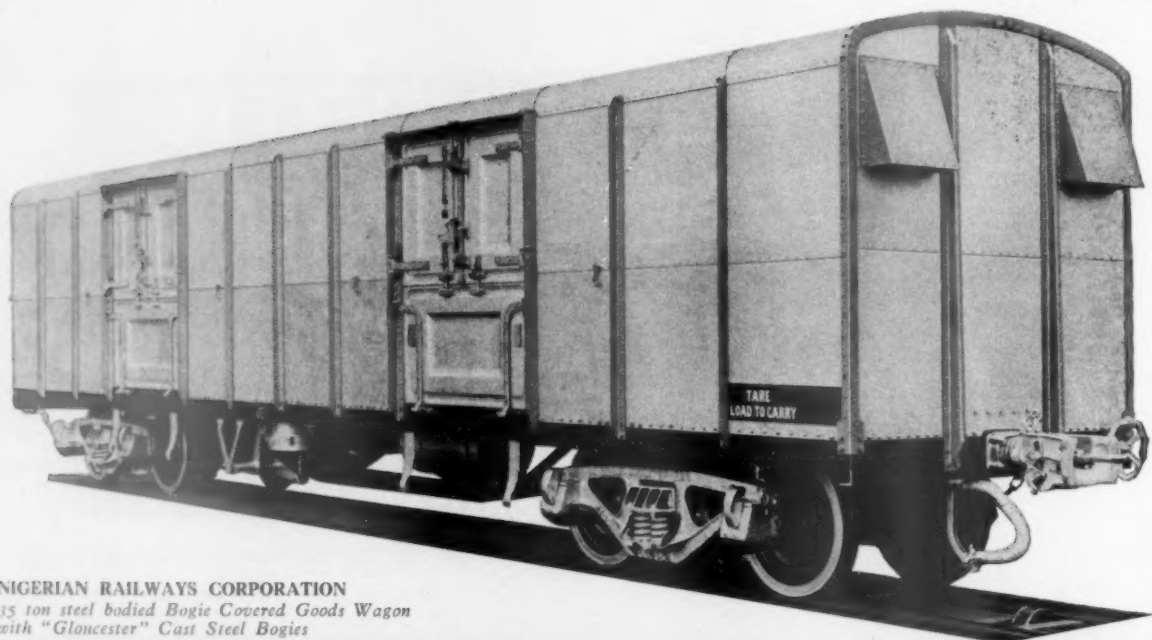
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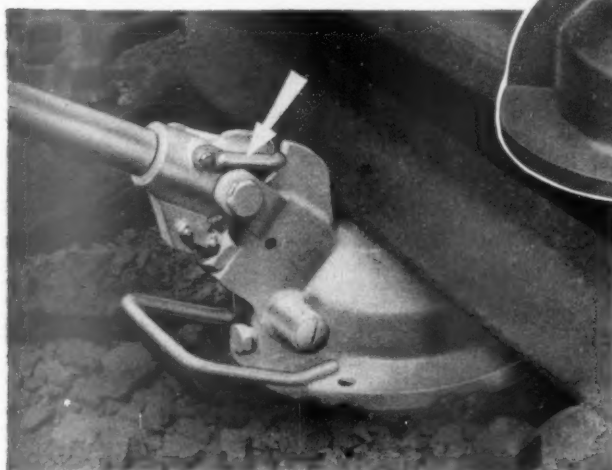
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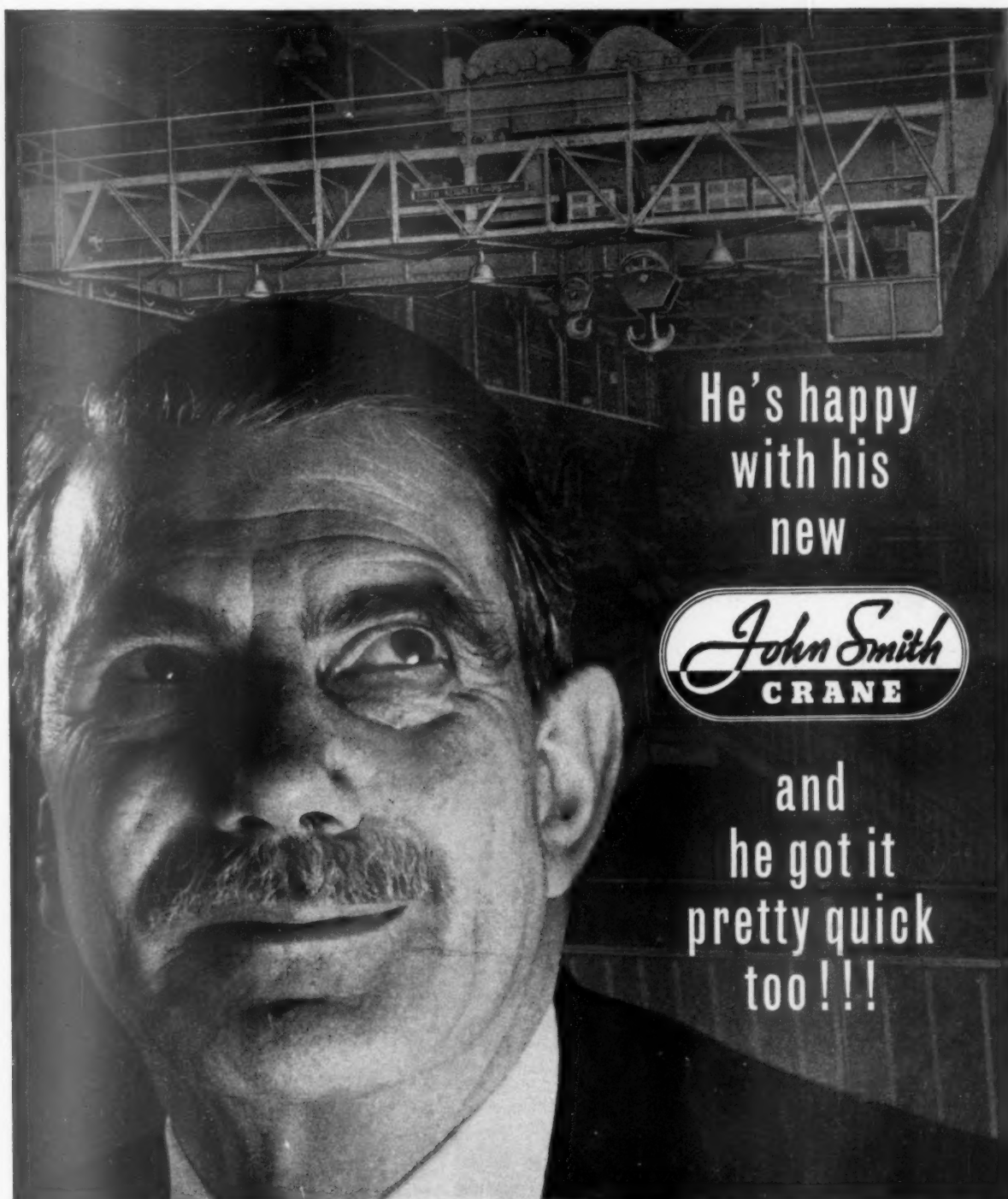
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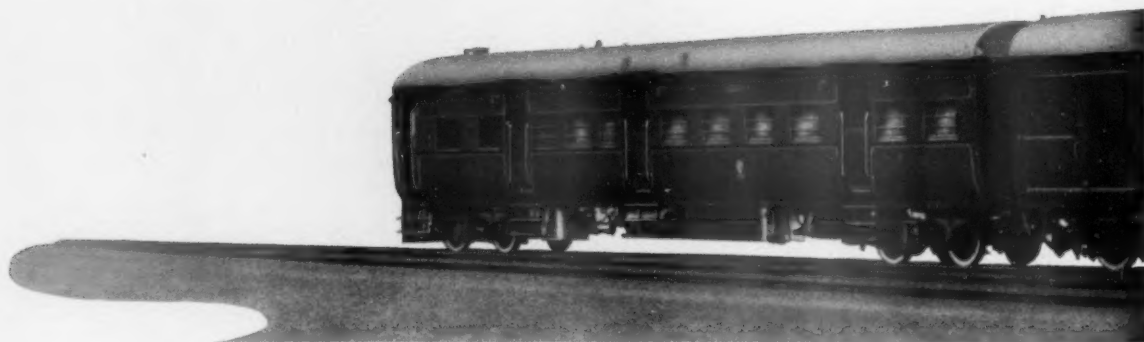
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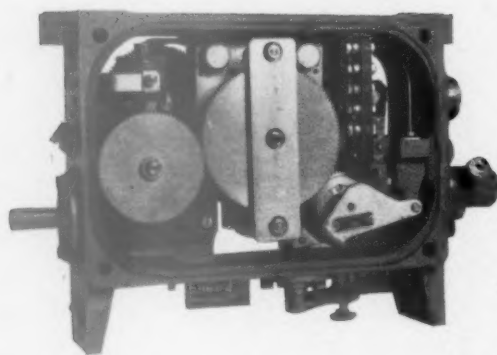


The Nigerian Railway Corporation have recently put into service two of these Twin Unit Diesel Railcars, supplied by the Drewry Car Co. Ltd., and built by Birmingham Railway Carriage & Wagon Co. Ltd. Each unit is fitted with Metcalfe-Oerlikon Patent Safety & Vigilance Control Equipment.

ANOTHER INSTALLATION OF THE

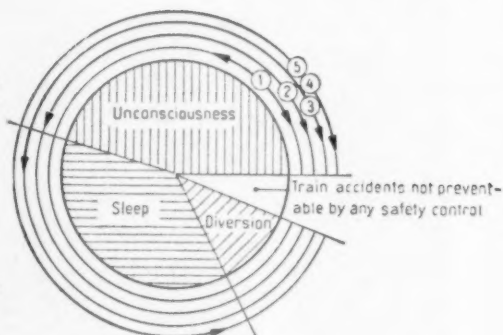


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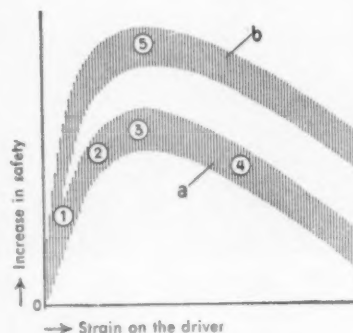
View of the safety side of the apparatus with the covers removed.

- 1 Normal Deadman's pedal.
- 2 Encased pedal for instep.
- 3 Sewing machine type pedal.
- 4 Pedal which must be periodically released.
- 5 Normal Deadman's pedal connected with the PATENT SAFETY and VIGILANCE CONTROL SYSTEM.



- a Range of existing safety controls with pedals.
 - b Range of the Metcalfe-Oerlikon safety control.
- 1-5 Various pedal arrangements as fig. 1.

THESE CHARTS ILLUSTRATE THE SUPERIOR CONDITIONS AND RANGE OF SAFETY OBTAINED FROM THE SAFETY AND VIGILANCE CONTROL SYSTEM.



For full description write for leaflet A.41

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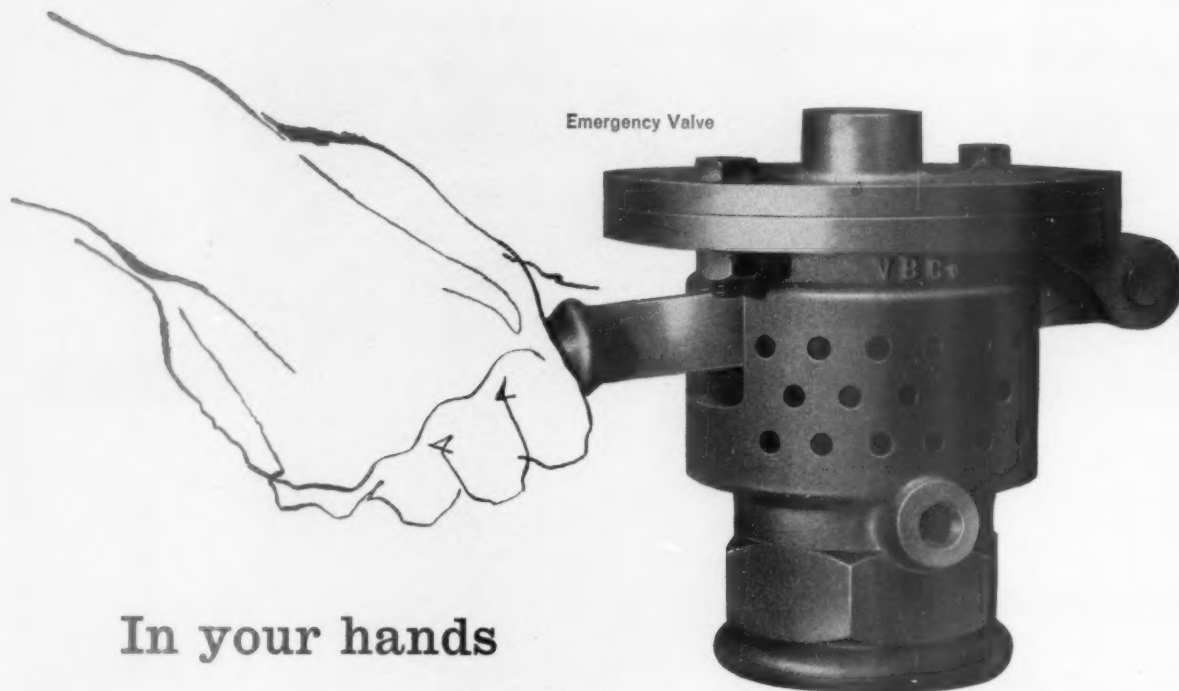
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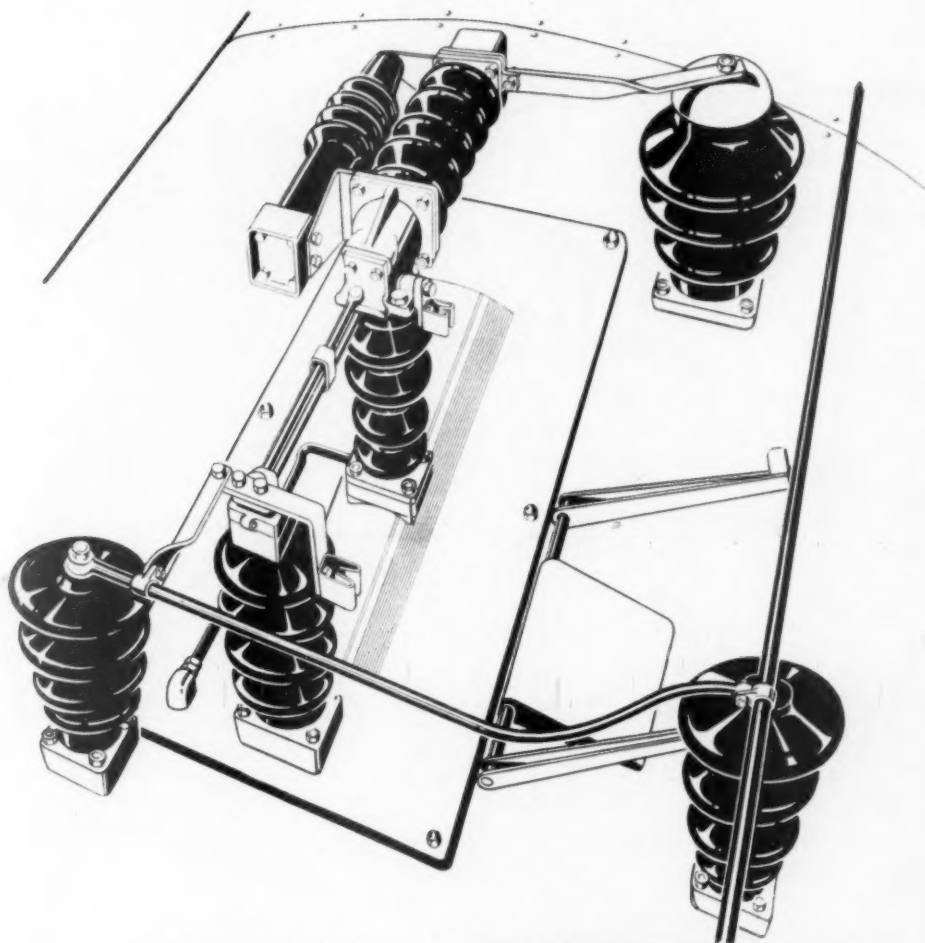
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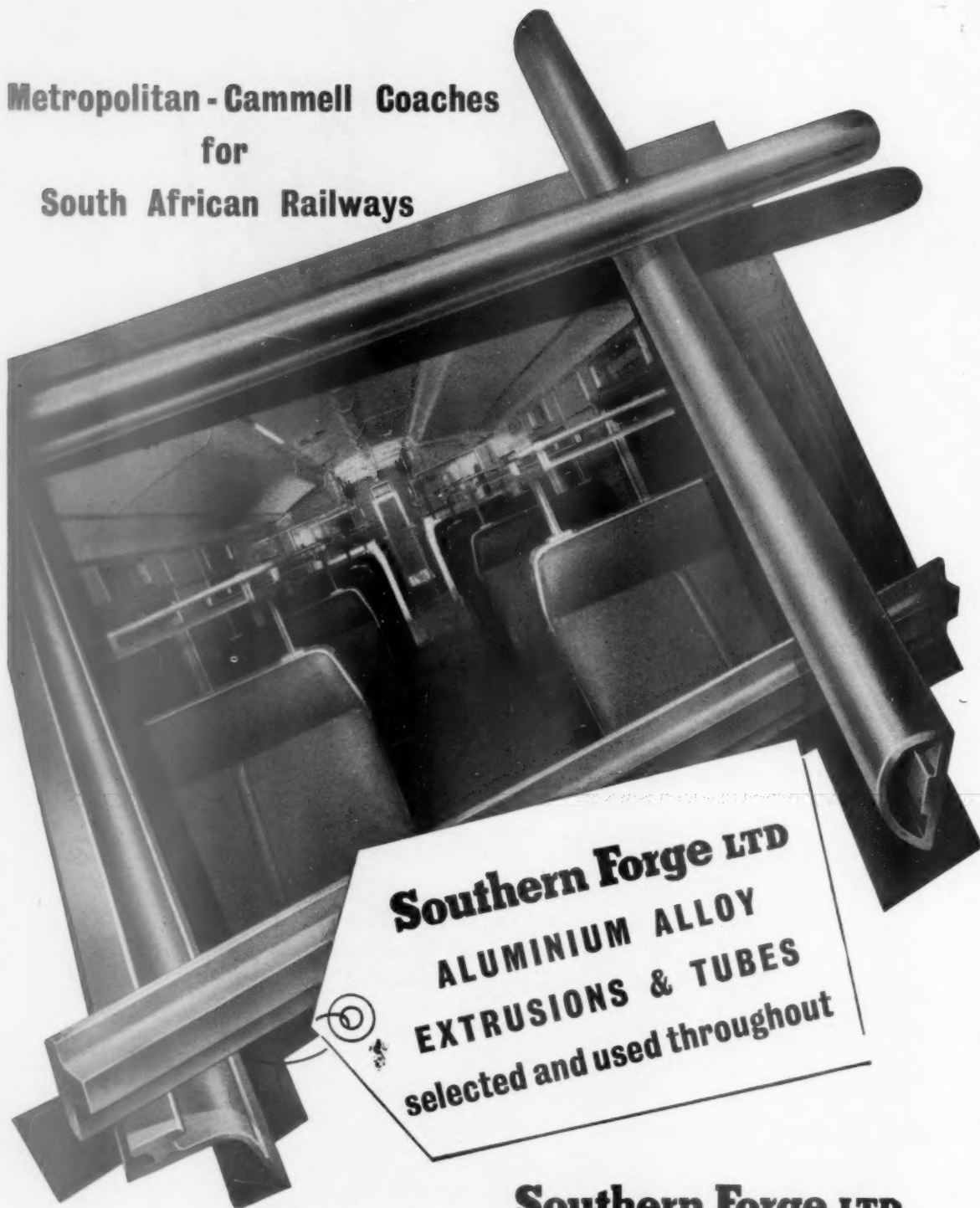
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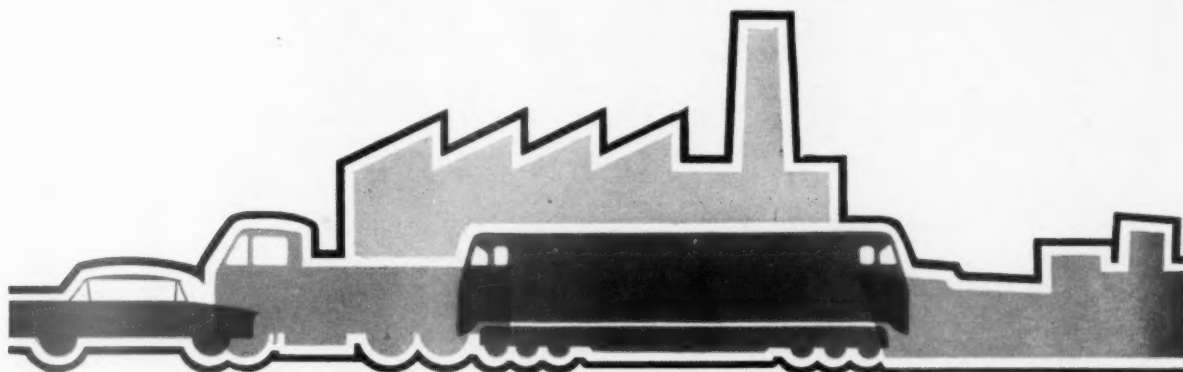
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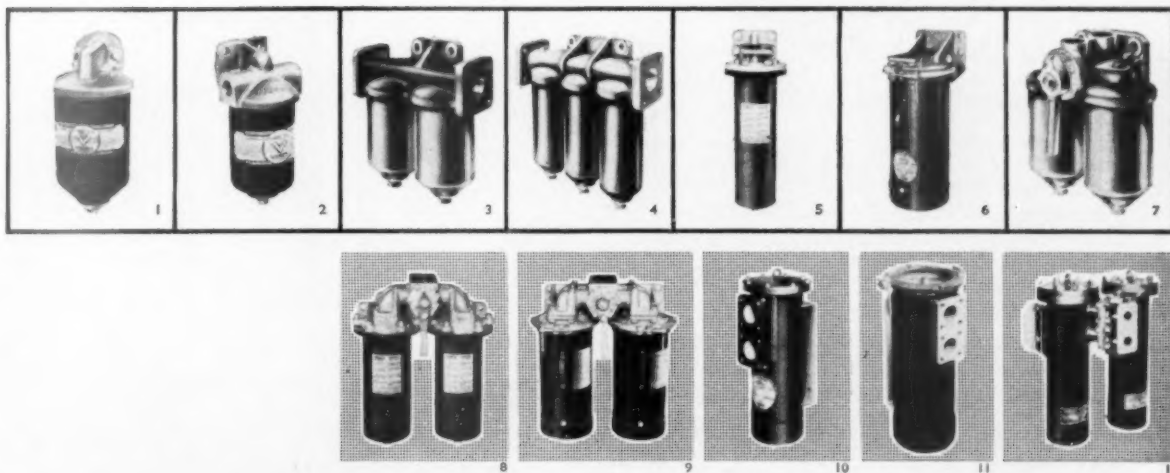
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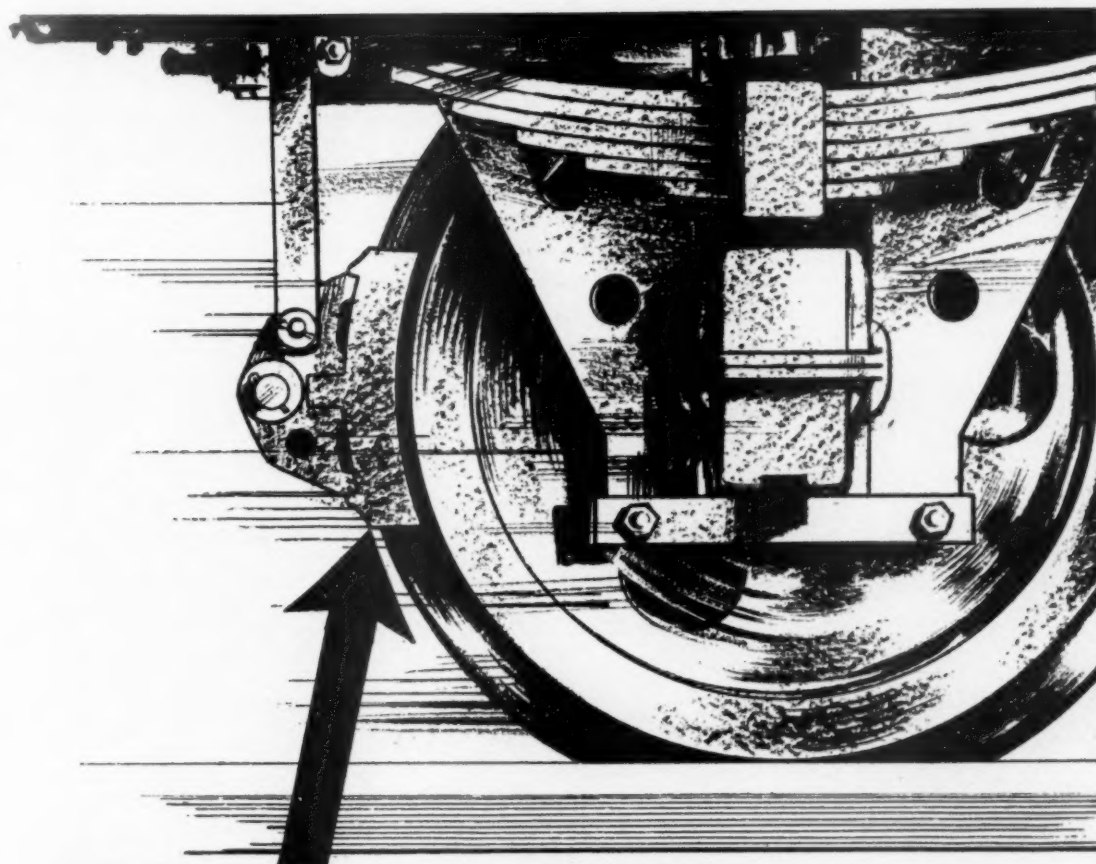
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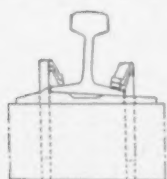
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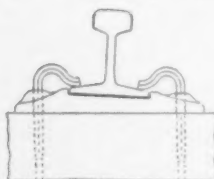
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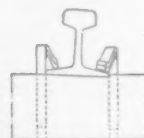
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A Journal of Management, Engineering and Operation

VOL 114

FRIDAY FEBRUARY 17 1961

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Integration—or co-ordination?

AS RECORDED elsewhere in this issue, Mr. John Hay, Joint Parliamentary Secretary to the Minister of Transport, spoke last week on the respective merits of integration and co-ordination of transport. Coming down heavily in favour of the latter, he claimed that only co-ordination could provide an efficient and economic system and retain that freedom of choice so essential to this country, where demands are many, varied, and often individual in character. This and other points from a lucid and interesting speech may well be true in present circumstances but, despite Mr. Hay's obvious belief that the recent White Paper contains clear instructions on how British transport is to be so co-ordinated, the fact remains that it does not. As we have stated before, it is full of vague phrases like that relating to the essential nature of "a railway system of the right size," a phrase Mr. Hay actually goes on to quote. In doing so, he tacitly admits its imprecision for he

comments that deciding the railway's size raises "a very difficult problem," and one to which the new Railways Board will have to give much thought. The speech is of special interest in view of our own belief that the appointment of the Chairman of this Board is imminent, for he also refers to the White Paper's statement that the Government recognises the importance of getting "the right people" to run British Railways. The right man to run the new Board is a man of long and varied practical railway experience, skilled in administration, and able to count on the loyalty and confidence of railway officers throughout the system. Whoever he be, it is essential that he enjoy the maximum possible degree of autonomy, and full authority under the Minister, during the interim period to elapse before the new structure is finalised by legislation.

Mr. A. C. B. Pickford

GREAT regret has been occasioned by the decision of Mr. A. C. B. Pickford, who has been Assistant General Manager (Traffic), Western Region, British Railways, for the last two years, to retire from the service because of ill-health. For some time his colleagues have been aware that such a course was likely because of indifferent health which has followed a recent operation, and the hope is widespread that the leisure he will enjoy after having served the interests of the railways so strenuously for many years will be beneficial to him. As will be seen from the illustrated biography which is given elsewhere in this issue, Mr. Pickford has been a traffic man for practically the whole of his career and, except for a period between 1948 and 1954, when he was Executive Officer (Terminals), Railway Executive, he has spent all his working life with the Western Region or its predecessor company. His intimate knowledge of the railway has been of great value during the past two years when Mr. Pickford has been primarily responsible for the re-organisation of the Traffic Department of the Western Region.

Institute of Transport visit to Belgium

NEARLY all aspects of contemporary transport except mountain railways are exemplified in Belgium. Among them are the Belgian National Railways 3,000-V. electrification, with dual-voltage trains running through to the Netherlands Railways 1,500-V. electrified lines; the cut-and-cover Junction Line through Brussels, connecting the re-built Nord and Midi stations; and the comprehensive system of electrified and diesel-worked light railways of the Société Nationale des Chemins de fer Vicinaux (S.N.C.V.). Members of the Institute of Transport who join in the Institute visit to Belgium on May 29-June 7 will have ample opportunities for study of these and other applications of modern techniques. Besides installations of the S.N.C.B., groups or individuals can inspect parcels handling by rail and road at the Brussels Custom House; and the Port of Antwerp. Those who travel *via* Dover/Ostend will see something of the operation of the magnificently equipped motor ships of the Belgian Government packet

service and of the fast electric trains between Ostend and Brussels. The visit is likely to be popular, and intending participants should apply to the Institute immediately.

Burma State Railways modernisation

THE Burma Railway Board, having completed its rehabilitation programme for the years 1955-59, is now embarking on a four-year programme covering the period 1961-64. The plan is to increase motive power, shorten the turn round time of freight wagons and increase passenger capacity, particularly for commuter and branch line services. It provides for the purchase of diesel-electric locomotives, diesel railcars and railbus units for suburban traffic in Rangoon and Mandalay, mechanical signalling and workshop equipment, and underframes for coaches and goods wagons, the bodies of which are to be built in Burma. In addition, some sections of track are to be re-laid with heavier rail, and bridges will be strengthened to accommodate heavier and faster trains. The total cost of this programme is estimated at the equivalent of U.S. \$50 million. To help with the purchase of equipment abroad, the World Bank has made a loan of U.S. \$14 million to the Burma Railway Board.

Co-ordinated development in the North East

THIS week, Mr. F. C. Margetts, Assistant General Manager (Traffic), North Eastern Region, British Railways, continues the story unfolded last year by himself and some of his traffic officers of the general development of the Region under British Railways' modernisation plan. Stressing that development in the North East has not been, and will not be, confined to the traffic sides of railway operation, he refers to track and bridge improvement works, extensive re-signalling, and reminds his readers that large-scale works such as an overall marshalling yard plan or a change in motive power must require the study of, and co-operation with, the plans of the other railway Regions involved. He points out that co-operation is the key to the situation—both with outside interests such as other Regions and local authorities, and within the structure of the Region itself, in so far as normal work must be carried on in the midst of the progress which is taking place.

Railway authority for Swaziland

THE establishment of a railway authority in Swaziland to take over responsibility for the proposed new line which will link the territory with the railway system of Portuguese East Africa was decided upon at a recent meeting in London. The new line is an essential pre-requisite of the implementation of plans to develop Swaziland iron-ore deposits at Bonvu Ridge. It is estimated that the combined cost of building the railway and developing the iron-ore deposits would be about £12 million. Apart from its decision to establish the railway authority the London meeting agreed that a representative be sent to Lisbon to discuss the matter with the Portuguese. Present at the meeting were officials of the Anglo-American Corporation and the Colonial Development Corporation. The British Government was represented at junior ministerial level. It is understood that so long as the Portuguese reactions are favourable the only question which remains to be settled is that of financial participation in the railway portion of the combined project.

Conference on Flame-Hardening

RAILWAY civil and mechanical engineers and suppliers of railway equipment will hear much of interest at the Twelfth International Flame-hardening Conference at the Haus der Technik, Essen, on March 6 and 7. This is one of a biennial series convened by Paul Ferd. Peddinghaus, makers of flame-hardening equipment. Two of the papers are concerned

specifically with railways: on the hardening and tempering of rails and points, by Herr Binnewies, of Witten; and on hardening of locomotive wheel tyre flanges, by Herr Schimming, of Dresden. Most of the other 17 items have some bearing on railway engineering. The papers in German will be interpreted simultaneously on short-wave radio. Some 600 delegates from all parts of Europe are expected to attend. All are invited to visit, on March 8, the Peddinghaus works at Gevelsberg, where flame-hardening machines will be demonstrated. Intending participants should apply immediately to Surfard Limited, Abford House, 15, Wilton Road, London, S.W.1. The conference fee is DM.30, payable in Essen. Hotel accommodation will be reserved on application to the Essener Verkehrsverein, Essen, and air and other travel arrangements will be made by Conference Organisers Limited, 36, Victoria Street, S.W.1.

Standard-gauge construction in Western Australia

CONSTRUCTION of a standard-gauge line between Kalgoorlie and Perth, Western Australia, seems certain within 10 years as a result of a decision by Broken Hill Pty. Ltd. to establish a £40 million steelworks at Kwinana. The steelworks project depends on agreement between the Western Australian and Commonwealth Governments to construct a £35 million standard-gauge line between Kalgoorlie and Fremantle with extensions to Kwinana. Agreement between the Western Australian Government and Broken Hill Pty. Ltd. stipulates that the line must be built because it is vital to the new industry. The W.A. Government has presented the Commonwealth with a strong case for the line based on the need of the projected industry and its importance to the nation. In return for an iron-ore lease near Southern Cross, Broken Hill Pty. Ltd. will construct a blast furnace, steel-making plant and rolling mill, ancillary developments and additional wharfage at Kwinana. The agreement provides for the blast furnace to be in operation by 1968 or by the completion of the standard-gauge line, whichever is the later, with the steel plant and rolling mill 10 years after that.

Testing dual-voltage lines

THE series of electrical failures experienced by British Railways, Eastern Region, in the majority of one type of stock on the newly electrified North-East London suburban services at the end of last year, was a serious blow to the Railway prestige, coming so soon after a widely publicised and eagerly awaited opening. The manufacturer of the equipment, the General Electric Co. Ltd., rectified the faults after the stock had been withdrawn from service, and now, as a result of consultation with the British Transport Commission, the G.E.C. has fitted out a three-car unit as a mobile laboratory to establish the working conditions of the high-voltage electrification on the line. The instruments fitted in the motor coach will measure and record voltages and currents at every stage of the trains traction system. Cathode-ray oscilloscopes will show the test team the state of the circuits under actual running conditions. British Railways is pioneering a new system, and any new research on dual-voltage operation will be welcomed.

French accelerations

ELECTRIFICATION in progress on several main lines of the French National Railways does not seem to cause appreciable decelerations. This year's summer passenger services will include faster runs made possible largely by electrification recently completed or to be finished by the end of May. On the Paris-Strasbourg line, for instance, completion of conversion at 25 kV., a.c., between Bar-le-Duc and Châlons-sur-Marne, besides introduction of electric traction between Blainville and Lérrouville last December, will afford timings for seven eastbound expresses over the 313 miles faster by 5-55 min. than last summer.

The quickest will be the 8 a.m. from Paris Est, allowed 4 hr. 43 min. against the present 5 hr. 11 min. These schedules include that of the "Orient Express," which will leave Paris 50 min. later at 9.15 p.m. and reach Vienna West 50 min. earlier at 2.50 p.m. This famous train is misnamed even now, for its main portion runs no further east than the Austrian capital, and the present Warsaw branch is to be curtailed at Prague in May. A new secondary day service between Paris and the Riviera will afford an 8½-hr. schedule from Paris Lyon to Marseilles, 536 miles.

Victorian Railways superannuation

AFTER acceptance on February 2 by the Trades Hall Disputes Committee of the offer made by Mr. H. Bolte, Premier of Victoria, all rail services in Victoria reverted to normal and overtime restrictions were lifted as from February 5, beginning of the fortnightly pay period. According to union officials, 93 per cent of railway employees, some 26,500, can now obtain service grant. Terms of settlement, over the choice of which employees may take three months, are as follows:—

(a) Railwaymen retaining full superannuation (over four units) will not receive service grant or retiring gratuity unless they are 40 years of age with 20 years' service, or over 45 with 15 years of service or over 50 with 10 years' service. These categories can retain from five to 23 units and gain 10s. a week service grant.

(b) Railwaymen with four units or less of superannuation will obtain service grant only.

(c) Those without superannuation will obtain service grant and retiring gratuity.

Service grants are 5s. a week for more than three years' rail service, 10s. a week after five years' service, and 20s. a week after seven years' service. Retiring gratuity will be £22 10s. for each year of rail service on retirement at 60 years of age or over, or earlier in case of illness or death if a minimum of 10 years' rail service has been worked. After the necessary Government legislation, the Act will be passed to Arbitration Commission for inclusion in railway awards. Although the Victorian Government will not meet again until March 7, the Service Grant will date from February 5 and all previous rail service will count for payment of service grant and gratuity.

At present, long-service men with up to six or eight units of superannuation can hand in all their units, obtain a monetary refund, get the service grant and £22 10s. for each year of service. In some cases, this means a refund of hundreds of pounds, up to £3 a day more in pay, and a lump sum on retirement. A few anomalies still exist: if an employee hands in all his superannuation units, he loses his permanency and is regarded as a supernumerary employee although length of service and classification of position are now used in appointments to higher grades. Unless this is changed, many railwaymen will keep four units and thus retain status. Unions are discussing this aspect of the position with the Victorian Railways Staff Board.

Kowloon-Canton Railway

THE Manager and Chief Engineer of the Kowloon-Canton Railway (British Section), Mr. P. H. Lam, has sent us a copy of his report for the year ended March 31, 1960. Mr. Lam took over from Mr. I. B. Trevor in October, 1958, as Acting General Manager, and on January 15, 1960, the posts of General Manager and Engineer of Way and Works were combined and re-designated Manager and Chief Engineer.

In this, his second report, Mr. Lam is able to record that the year closed with the highest operating revenue surplus and also profit since 1950-51, the surplus reaching K.H. \$4,542,016 and the profit \$2,668,861. But operating expenditure also increased, by \$489,355 to \$4,096,150. This was brought about by increased salaries, pensions and gratuities

beyond the control of the Department, and by the considerable outlay of \$171,015 to restore damage to cuttings and embankments caused by torrential thunderstorms in June, 1959.

Train punctuality continued to improve during the year, with 78.62 of the 8,783 scheduled passenger trains running on time. Local passenger traffic again showed an upward trend, with a rise of 14.15 per cent over 1958-59, mainly because of the rapid increase in population of the New Territories. The movement of passengers to and from China varied considerably during the year, and in all nearly 886,000 passengers were carried, an increase of 31.56 per cent.

Export goods tonnage rose 24.21 per cent, and import tonnage went up by 20.88 per cent. Pig imports, a traditional feature of incoming traffic, amounted to 256,407 head, or 8,421 below the previous year's record.

Mr. Lam comments on the tendency for costs of maintenance of the five diesel-electric locomotives introduced into service in 1955, to rise. An exceptional expenditure during the year was necessary on one locomotive, which had a broken cylinder due to seizure of the piston in its liner, and the locomotive was out of service for nearly two months, lowering the percentage availability of the diesel-electrics by 6.4 per cent to 91.12 per cent. Since their introduction, until the year under review, none had had their wheels changed. Fuel consumption rose, partly because of heavier traffic, but also in part because of the increasing age of the locomotives.

The following are some of the principal purely railway results compared with those for 1958-59:—

	1958-59 \$	1959-60 \$
Railway operating revenue ...	7,758,589	8,638,167
Railway operating expenditure ...	3,606,795	4,096,151
Net railway operating revenue ...	4,151,794	4,542,016
Passenger receipts ...	4,861,244	5,667,425
Goods receipts ...	2,345,639	2,356,969
Train-kilometrage run ...	375,326	390,025

British Transport Commission traffic receipts

STRICT comparison between the first four-week periods of this year and 1960 may not be possible because of the incidence of week-ends affecting industrial production, and travel. But it seems clear that most of the passenger traffic of the British Transport Commission's undertakings started the year at least reasonably well. The marked rise in ships' passenger receipts was partly the result of the strike affecting the Belgian Government Dover/Ostend service, from which traffic was diverted to British Railways, Southern Region routes. Railway passenger revenue depends on many factors such as excursion bookings and the weather. No valid com-

	Four weeks to January 29, 1961		Incr. or decr.
	1961	1960	
Passengers—			
British Railways ...	£000 9,570	£000 9,092	+ 478
London Transport			
Road Passenger Services ...	4,228	4,192	+ 36
Railways ...	2,150	2,001	+ 149
Provincial & Scottish buses	4,297	4,080	+ 217
Ships ...	285	245	+ 40
Total passengers ...	20,530	19,610	+ 920
Freight, Parcels & Mails—			
British Railways			
*Merchandise & livestock ...	7,730	7,905	— 175
*Minerals ...	3,791	3,927	— 136
*Coal and coke ...	9,207	9,650	— 443
*Parcels, etc., by coaching train ...	3,920	3,983	— 63
*Total Freight British Railways ...	24,648	25,465	— 817
Others ...	4,516	4,002	+ 514
Total freight, parcels and mails ...	29,164	29,467	— 303
Total ...	49,694	49,077	+ 617

* Includes receipts from collection and delivery, etc.

ment can be made on passenger receipts for the four weeks to January 29. The increase over last year's figure is only by some 5 per cent. A year ago British Railways passenger

receipts for the first four weeks of the year were nearly 8 per cent up on those for January, 1959. London Transport Underground receipts show a rise of over 7.4 per cent. L.T.E. road traffic receipts are disappointing in view of an improvement in services. The provincial and Scottish bus undertakings seem to be holding their own in competition with road transport.

Railway merchandise, mineral, coal, and parcels traffics all started the year badly, in view of the need for increased revenue to improve the financial position of the Commission and of the efforts made to win traffic. The drop in mineral receipts, of 3.4 per cent against these four weeks of 1960, compares with a rise last year of 12.4 per cent over the corresponding 1959 figure. This traffic depends on activity in the steel industry, and everything possible is being done by British Railways. Coal class traffic, which during the later months of 1960 rose largely because of stocking up of domestic coal, is back again below last year's figure, and this trend may well continue. The most disappointing is railway merchandise traffic, in which a rise might have been expected. The 12.8 increase in freight receipts of undertakings other than railways seems to be derived largely from road haulage.

PERCENTAGE VARIATION 1961 COMPARED WITH 1960

	Four weeks to Jan. 29, 1961
British Railways:	
Passengers	+ 5.2
Parcels	+ 2.2
Merchandise & livestock	+ 2.2
Minerals	- 3.4
Coal & coke	- 4.5
Total	- 1.0
Ships (passengers)	+ 16.3
British Road Services, Inland Waterways & Ships (cargo)	+ 12.8
Road Passenger Transport, Provincial & Scottish	+ 5.3
London Transport:	
Railways	+ 7.4
Road services	+ 0.8
Total	+ 2.9
Aggregate	- 1.0

Protection of structural steelwork

CORROSION of steel is so universally destructive and costly that its protection is a subject of constant study by civil engineers. One aspect, protection for structural steelwork, was discussed in a recent paper at the Institution of Civil Engineers and presented jointly by Messrs. F. Fancutt and J. C. Hudson; it is entitled "The Choice of Protective Schemes for Structural Steelwork."

In 1947 these same authors presented a paper at the Institution on virtually the same subject, and their 1961 paper covers developments in protective measures since 1947 and particularly those in the past nine years. Its emphasis is on schemes to combat atmospheric corrosion in the United Kingdom, but the effects of water and soil corrosion are also briefly referred to, as is the protection of structures overseas.

In Britain iron is practically unaffected by purely atmospheric corrosion so long as the air-humidity is less than 80 per cent, but above that figure it is proportional to the pollution. This pollution is mainly sulphuric and to a lesser extent hydrochloric acid derived from smoke. The other cause of corrosion in this country is sodium chloride carried inland by spray-laden sea breezes. From observations at various inland places in England it appears that the rate of sulphur-produced rusting may vary from 2.3 mils per year where relative sulphur pollution is only 0.5 to 4.3 mils per year resulting from 3.6 pollution. With regard to saline corrosion it is pointed out that its severity decreases rapidly with distance from the sea. For instance, at Lagos in Nigeria salt-rusting was found to be 37.7 mils per year at the high-water mark but fell to only 2.2 mils per year 350 yards inland.

The paper reminds one that in all cases rusting in steelwork occurs most rapidly at joints or in crevices where water and

dirt can accumulate. However, bare stainless steel in the atmosphere is virtually incorrodible, and low-alloy steels are also comparatively resistant. But when low-alloy and mild steel are totally immersed in either fresh or salt water the former is no more resistant than the latter. Various ordinary protective coatings for underwater structures are available and well known, but cathode protection may also be used.

After the introductory remarks on general principles summarised above, the authors of the paper make their first and emphatic recommendation that too much care cannot be taken to shape design to combat the rust problem. Avoidance of water- and dust-collecting crevices and adequate provision of facilities for maintenance are primary considerations. Back-to-back steel sections, uneven "ply" edges and similar rust traps should be avoided and every facility—if necessary including cat-walks—should be provided for painters. Simplification in design and particularly welding have already improved matters, but designers must be constantly on the watch for potential corrosion troubles.

Correct surface preparation by such methods as hand- and flame-cleaning, pickling and grit-blasting pay handsome dividends; the two latter are increasingly recognised as specially effective and essential. For hand-cleaning power-driven tools, now available in wide variety, should be used in preference to wire-brushes and scrapers as they are far more effective and economical. Spraying with chemicals such as calcium chloride to loosen rust have been tried but have done more harm than good; alternatively, flame-cleaning after a brief period of weathering has proved very satisfactory in removing mill-scale. If this is then immediately followed by cleaning to allow the priming coat of paint to be applied before the metal cools a dry surface and a quickly-drying paint are assured. Nevertheless, the lasting-property of the paint in these conditions is inferior to that applied after grit-blasting, which is recommended as the best method of preparing steelwork for painting. Its only disadvantage is that it roughens the surface and so requires more paint to fill in the depressions.

During the past decade the importance of choosing a good protective scheme, including an adequate paint film thickness, and especially the need for proper surface preparation have been much more fully realised. Many new protective paints have been produced and the use of spray-metal coatings has become increasingly popular. Sprayed aluminium and also galvanising are much to the fore, and the marked resistance of metal coatings to mechanical damage is outstanding, even if the outer coating of paint is damaged.

After discussing progress in the technology of protective paints, the paper points out the advantages and disadvantages of those introduced in recent years. Recent methods of paint application, such as roller-painting for broad, flat surfaces, and improvements in spraying methods are also reviewed. Airless spraying eliminating spray-fume is important in enclosed shops because it reduces the volume of air needed for ventilation; it can also be done at double the speed of air-borne spraying.

In planning a steel structure the method of its protection is a first consideration because it affects the detail drawings. The types of thickness of coating should be related to climatic conditions. Sulphur pollution can be measured with a lead-peroxide instrument, and the duration and intensity of sunlight must be considered. Parts of a structure may need better protection than others depending upon accumulation of water or even dew. The choice of protective schemes should be based on the total costs of protecting the structure throughout its entire life and not only the initial costs.

Other notes on specifications follow. In this connection three specifications for grit-blasting drawn up by the Steel Structures Painting Council are quoted, and others for types of paints are available as British Standards. However, the authors recommend consultation as to numbers of coats and other details with manufacturers of repute, whose scientific investigating facilities are probably the most comprehensive.

For protection of exposed steelwork overseas particular regard must be paid to climate and especially sun-temperature and rainfall. It will have to be decided whether part, and if so how much, protection is to be provided in the country of origin or whether it shall all be done at site. This will depend on conditions and duration of shipment, availability of coating facilities overseas, and quality of the local labour there. Temperatures if extreme will affect "brushability."

In conclusion the authors point out that though many facts still remain obscure, it is clear that any scheme of protection must be considered exhaustively beforehand down to final details, and not left to improvisation after erection when rusting has already begun. Also that it is false economy to skimp initial protection, on which money, within reason, is well spent and will produce later economies in maintenance and in lengthening the life of the structure.

Transport for a unique steel plant

BY A CORRESPONDENT

AMONG the large steel plants in Britain the Consett Iron Works is singular in having kept blast furnaces blowing for 100 years on a hill-top in North West Co. Durham, 850 ft. above sea level. The original works used iron ore from local sources and had abundant coal and limestone nearby. Soon they had to obtain Cleveland ore from North Yorkshire and haematite ore from Cumberland. All this must be worked uphill to Consett. W. Weaver Tomlinson's history of the North Eastern Railway tells how several railways were planned to simplify movement of 400,000 tons of ore a year needed to manufacture 150,000 tons of iron. The railways also helped the ironworks to surmount the widespread financial crisis of November, 1857, by giving a re-constituted ownership credit for traffic dues to the amount of £200,000.

Ten years later the N.E.R. opened the Derwent Valley branch between Blaydon and Consett, primarily for heavy mineral traffic to the ironworks. About 20 trains a day used the branch in recent years, with loads restricted by the steep gradients. The River Derwent runs through a beautiful valley below the works to join the Tyne. The journey by passenger train, through beautiful scenery *via* Ebchester and Shotley Bridge to Blackhill, on the verge of the ironworks, and then down the Lanchester branch to Durham City, is no longer possible. All passenger services have been withdrawn from the district between the Tyne and the Wear, of which Consett is the centre, though the Consett Ironworks alone employs 7,750 people.

The British Transport Commission informed the select Committee on Nationalised Industries that the railways were "almost the sole inland carriers of the main raw materials used by the iron and steel industry." That is not entirely true of Consett. The Consett Iron Co. Ltd. obtains by road transport ganister, the raw material for silica refractories, from three quarries. The oldest, at Buttsfield, five miles south of Consett, has produced nearly 500,000 tons in the last 40-50 years, moved successively by horse cart, steam traction engine, an overhead ropeway, and now by road motor vehicles. The output of another quarry at Allenshields, about six miles from Consett, is also moved by road. About 800 tons of ganister a week from the quarry at Harthope, in Weardale, at an altitude of 2,000 ft., is carried by road 27 miles to the ironworks. Road vehicles also bring about 3,000 tons of limestone weekly from Weardale. For many years the Consett Iron Company owned quarries in the dale from which the limestone was hauled up Crawley Bank and over the Waskerley line, which reached an altitude of 1,445 ft., and thence by Rowley to Consett. When these quarries were exhausted, the Crawley incline was abandoned and the Weardale road hauliers carried limestone to Consett from other sources. In some respects the change from rail to road haulage suited the Consett Iron Company, which was saved the cost of unloading railway wagons and could regulate the flow of inward traffic

more easily than if it had moved in train-loads. The company also receives about 2,400 tons of limestone, dolomite, and doloma by rail from the Coxhoe quarries *via* Ferryhill.

The fundamental need remains for an ample supply of iron ore. For that the Consett Iron Company relies on imports of about 1,350,000 tons a year. It agreed, therefore, to cover capital charges incurred by the Tyne Improvement Commission in building a deep-water quay at Tyne Dock, equipped with grabbing cranes and ore storage bunkers, which can transfer 500 tons in a matter of seconds to 56-ton hopper wagons fitted with power-operated doors. As many as 14 special trains of these wagons may make the journey to Consett, 22 miles, mostly uphill, in a working day. At the ore terminal in the works the wagons discharge into storage bunkers at one sweep and are then ready to work back. The scheme was evolved in consultation with British Railways, North Eastern Region, and has worked satisfactorily. Recently ore cargoes of 32,000 tons have arrived in the Tyne from Venezuela; last July one of these was discharged in 47 working hours.

In September, 1960, another regular train service between Jarrow, adjacent to Tyne Dock, and Consett started when a rake of 16 tank wagons carried heavy fuel oil for the re-heating furnaces at the new plate mill which the Consett Iron Company has erected at Hownsgill. The mill soon will be rolling 10,000 tons a week, so that it will need three trains of oil weekly. Unfortunately, during construction there was no siding access to the site, so that all fabricated steelwork came from Teeside by road, as did heavy machinery from Sheffield which was out-of-gauge for rail transport. It is doubtful whether even if a siding had been provided, the railways would have carried much of the traffic. Road transport conveyed the goods direct to the site usually beneath a suitable crane and to places where rail access was impossible. In addition, construction material and machinery are needed in sequence, which can be more readily arranged by road than rail.

Outward traffic from the works was put on rail until the New Jarrow Steel Company was formed in 1936 to relieve unemployment on Tyneside. In conjunction with the Government and the Nuffield Trust, the Consett Iron Company took over management of the Jarrow Works, which manipulated semi-finished steel made by the parent company. Failing to obtain an economic rate for the traffic between Consett and Jarrow, the company set up a fleet of road vehicles to convey about 4,500 tons of billets and slabs a week, which gave efficient service at reduced cost. The Consett Iron Company also has found road hauliers eager to handle special lots of steel wanted urgently. It also uses motor vehicles and other mobile equipment for movements within the works.

Despite this, the railways are and must be the main transporters of inwards raw materials and outgoing steel. In total Consett received, by rail, about 90 per cent of the material required to make about 1.25 million tons of ingots each year. In addition about 75 per cent of the outgoing traffic is rail-borne. By 1963 the ingot output will be 1.5 million tons.

Use of road transport and modern mobile equipment for internal traffic movements is growing, but the company's 28 diesel locomotives handle weekly about 60,000 tons of inwards raw materials and 20,000 tons of finished steel, and they deal with some 80,000 tons weekly of material for allocation to the various departments and the disposal of slag, recovered scrap, and other oddments.

Relations between the Consett Iron Company and the N.E.R. were always friendly. Sir David Dale, who controlled the Iron Company's operations, was a Director of the N.E.R. for 25 years, and the present Chairman of the Consett Iron Company, Viscount Ridley, was a Director of the London & North Eastern Railway until nationalisation in 1948. Friendly co-operation will continue. It is believed that the company's latest development enterprise, costing £30 million, will justify the claim that Consett steel in larger quantities is still the best in the world, and will increase the volume of railway traffic in the North East.

LETTERS TO THE EDITOR

THE EDITOR IS NOT RESPONSIBLE FOR THE OPINIONS OF CORRESPONDENTS

HIGH-VOLTAGE LOCOMOTIVES

February 2

SIR, I refer to the article in your January 13 issue on 25-kV./6.25-kV. 50-cycle a.c. electric locomotives for operation in the London Midland Region, British Railways.

From the accompanying table of details of Berne-Lötschberg-Simplon Railway, British Railways, and Swiss Federal Railways locomotives it is not clear that the British design is already out-dated? Either it is too heavy for the h.p. rating, or the rating for the given weight should be about 5,000 h.p.

One can argue that the B.R. locomotive is of the rectifier type, so that a comparison should be made not with Swiss locomotives but with engines of the French National Railways; but the result is about equally unfavourable for British Railways.

	B.L.S.	B.R.	S.F.R.
Class ...	Ae 4/4	Type "A"	Re 4/4 II
Wheel arrangement...	Bo-Bo	Bo-Bo	Bo-Bo
Weight per axle (tons)	23	20	20
Total weight (tons)	80	80	83
Current ...	15 kV., 16½ cycles	25 kV./6.25 kV., 50 cycles	15 kV., 16½ cycles
Type of motors ...	direct a.c. commutator	d.c. fed through rectifiers	direct a.c. commutator
Top speed (m.p.h.) ...	78	100	87.5
Rating (h.p.) ...	3,950 (1 hr.)	3,220	5,525 (1 hr.)
Corresponding speed (m.p.h.)	47	60	62.5
Power/weight ratio (h.p./tons)	53	40	69
Year built ...	1943	1960	1961

Yours faithfully,

B. STEINER

Walchestrass, 27,
Zurich 6.

VERTICAL CURVES

January 3

SIR, I find that there has been an error in the penultimate line of the first paragraph of my letter dated November 11, 1960, and published in your November 25 issue. The sentence should read "but the rate of change of grade is half in the case of a sag" instead of "twice in the case of a sag."

Yours faithfully,

S. A. DESAI
Vice-Principal

Advanced Permanent Way Training School,
Government of India, Ministry of Railways,
Poona, 1.

THE AMERICAN RAILROAD POSITION

February 9

SIR, Since an article in your November 11 issue spoke of the gloomy outlook for American railroads their position has weakened persistently. In the last five weeks of 1960 wagon loadings were 532,900, or 22 per cent, lower than in the corresponding period of 1959. Both freight and passenger revenue decreased at nearly twice the rate of reduction in operating expenses. It is estimated that net income, available for improvements to property, reserves, dividends, and other purposes, amounted to \$450 million at the end of 1960. That is the lowest amount for any year since 1949, when strikes in many industries ruined railway traffic; it compares with an income of \$578 million for the poor year 1959, and is less than half the 1955 income of \$927 million, the best result in the past 13 years.

Snowstorms accounted in part for the bad finish to 1960,

and also spoiled the early weeks of 1961. During the first fortnight of the new year wagon loadings were down by 240,200, or 20 per cent. For the time being the prospects of a recovery in the trade and industry of the U.S.A. seem to be almost as bleak as the wintry weather. Unless there is an early revival in general business activity, the railroads will have difficulty in maintaining their lines and equipment efficiently. In December last they owned 23,500 fewer wagons than a year earlier and had over 9 per cent of the total stock under repair. As 20,000 fewer new wagons were ordered last year than in 1959, the railroads may be unable before long to cope with any sudden upsurge of traffic that may arise.

Yours faithfully,

YOUR CORRESPONDENT

Westminster, S.W.1

LOCOMOTIVE EXHIBITION AT MARYLEBONE

February 7

SIR, It is understood that an exhibition of locomotives is to be held on May 11-12, 1961, at Marylebone Goods Yard, London, N.W., in connection with the 50th anniversary of the Institution of Locomotive Engineers.

At the time of writing no statement has been made that the display will be open to non-members of that Institution. It is to be hoped that it will be open to all, and that it will continue for a further week, at least keeping open until about 9 p.m., so that all interested will be able to visit the exhibition after working hours. A small admission charge could be made and passed on to railway charities. Light refreshments could be on sale. Provision of seats would much increase the enjoyment of those who wish to discuss the exhibition and other railway subjects.

Might I also suggest that British Railways have its own "O" gauge model railway in operation, with its fine collection of locomotives, both modern and historical? If space allows, the several locomotive preservation societies might be asked to lend steam locomotives such as *The Earl*, which now awaits return to the Welshpool & Llanfair Railway, also one or two engines from the collections at Towyn and Portmadoc.

Yours faithfully,

RONALD SHEPHARD

The Four Winds Garden Cottage,
Lynchmere,
Via Haslemere, Surrey.

BOILER WATER TREATMENT

January 25

SIR, In the article "Boiler Water Treatment in the U.S.S.R." in your issue of December 2, 1960, it is stated that anti-foam mixtures in the form of powder can be added to the driver.

This statement raises interest in the reaction of the driver to this addition, and also raises the point that this may be the origin of the expression "to take a powder" which we previously connected essentially with the U.S.A. The probable answer is that the driver disappears behind the Iron Curtain, but a point of such scientific interest should be discussed at the highest technical level, and may well be suitable matter for a research programme throughout the Western world.

Yours faithfully,

D. PROCTOR-SIMS

Locomotive & Wagon Department,
Reunert & Lenz Limited,
10, Anderson Street,
Johannesburg.

The Scrap Heap

Revolt of the machine

The tenpenny ticket machine at Earls Court Underground station developed a fit of coughing during the morning rush-hour . . . and more than 100 tickets cascaded to the floor.—From the "Evening News," January, 1961.

Name not on it ?

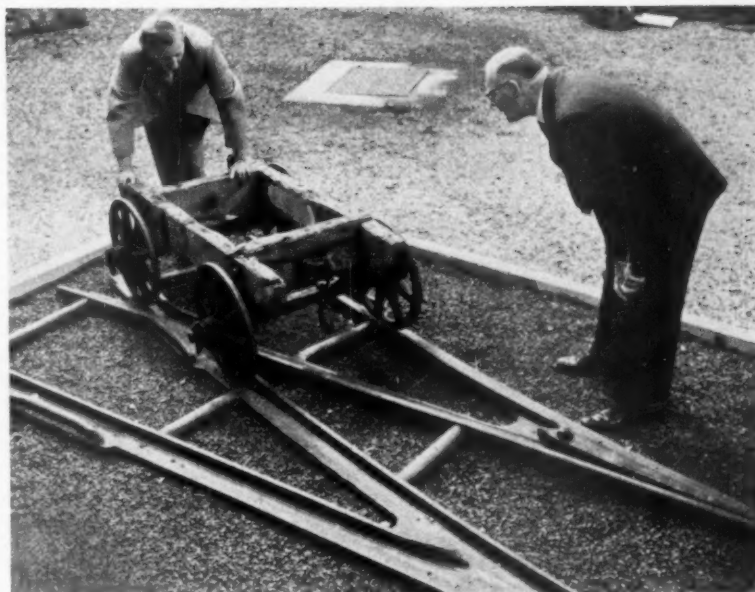
A former army officer, who has served with the Gurkhas in Burma, Java and Malaya and was awarded the Military Cross in 1944, recently travelled on the 6.54 p.m. train from Waterloo, to Bracknell in Berkshire. During the journey, the window of his compartment was shattered by a bullet. According to a report in the *Sunday Express*, he stated: "... this was the nearest I've ever been to a bullet. . . ."

Darby winners

At the top of this page we reproduce a "still" from the new Shell-Mex film "An Industrial Notebook on Iron and Steel," reviewed editorially last week. The "still" shows rails and points cast in iron by Abraham Darby in 1767, and believed to be the earliest example of their type in the world. Instead of turning out raw iron in pigs, Darby cast them as 8-ft. long rails which were then used on over 20 miles of track in and around Coalbrookdale Works. When large orders for iron were received the rails were taken up and sold. These points came from one solid casting. Note that the rails are flanged and the wheels of the truck also cast at the foundry are flat.

Time travel ?

From the way in which the Salisbury express swung round Clapham Junction's curved platform it seemed to be casting off London once and for all. Even before reaching Raynes Park the train must have been nearing its scheduled speed of a mile a minute. . . . My first view of the stage-coach road, now known as the A.30, came just after passing the station at Hook. . . . I thought of the drivers of such crack westbound coaches as the *Exeter Regulator*, the *Devonport Telegraph*, the record-breaking *Quicksilver*, giving their horses their heads just here. I could readily imagine their watchful and anxious glances at the swarming labourers making this high and level road for the iron horse. . . . Up the gradient beyond Andover Junction I soon saw Quarley Hill. . . . I found it very easy to picture the Roman surveyor standing up there . . . plotting the line for his road from London. I watched the actual bevel of his



First cast-iron rails in the world

road running towards me through long grass. It reached the railway bank. The metals, as if under his direction, curved at that very point. . . . As the train plunged into Salisbury tunnel I was wondering what changes would come during another hundred years. . . .—From "The Times," January 19, 1961.

Nice piece of cheesecake

The new English Cheese Maiden, attractive Miss Helen Jessop, travelled by Pullman train from Paddington to Birmingham, British Railways, Western Region, on February 7, and served English cheese to the passengers during the journey. She wore traditional dress. At Birmingham she was greeted by the Stationmaster of Snow Hill Station, Mr. R. Windsor, and the Dairy Princess of Birmingham, Miss Rita Chester. Mr. Windsor was presented with a cheese.

Goings-on at Bath

Reported to be "intrigued" by the idea, British Railways will co-operate with a "Roman orgy" to be held in connection with this year's Bath Musical Festival from June 1 to June 11. The "orgy" will be held in the spa's famous baths, and there will be a dance on the platforms of Green Park Station. Fifty "slaves" will serve wine and Roman dishes to about 250 guests brought by special train from Bristol, and after the last train has left on June 9 the station will be "taken over" by

750 dancers equipped with togas and drinking cups. Dancers will have access to the station's buffet and bars, and the special train will later take "orgiasts" on to the village of Wellow—for more dancing.

Unabridged version

Commercial artist James Teasdale was jailed for nine months at Sunderland yesterday for trying to steal a bridge. The judge called it "a monstrous impertinence." Teasdale, 32, who pleaded not guilty, claimed the borough engineer had given him verbal permission to demolish the bridge across a disused mineral railway line. He was in the act of doing so—with an oxy-acetylene burner—when police arrived.—From "The Daily Mail" of February 7, 1961.

Record average

An Englishman travelling on an American railroad, many years ago . . . asked the negro sleeping car attendant what was the average tip given him, and the negro replied, without hesitation, "A dollar, sar." The next morning the traveller handed a dollar bill to the negro, who grinned expansively and said: "Thank you, sar, that is a mighty fine tip, sar." "But," replied the traveller, "you told me last night that a dollar was the average tip." "Yes, sar," answered the negro, "but you are the very first gentleman that has ever come up to the average."—Glanville Williams in a B.B.C. broadcast.

OVERSEAS RAILWAY AFFAIRS

FROM OUR CORRESPONDENTS

QUEENSLAND

Mount Isa line reconstruction

Work on the first section of this work was expected to begin on January 15. Of the 242 miles between Richmond and Duchess, 200 miles are to be laid with new rails on the existing permanent way thoroughly levelled and reballasted. The remaining 42 miles will consist of deviations and new bridges, the work for which is being let out in various separate contracts. Tenders have already been invited for the construction of two of the major deviations.

WESTERN AUSTRALIA

Exhibition vehicle

A new trades and exhibition car recently constructed by the Government Railways has completed its first successful country tour. Locally manufactured furniture was displayed to advantage in the car which travelled 1,500 miles during which displays were arranged at 10 large centres where they attracted considerable interest. The car provided an excellent medium for country residents to view the many items of furniture at first hand and in very suitable condi-

tions. It has a display area of 58 ft. by 8 ft., the interior walls are painted white, and the ceiling primrose. Provision has been made to permit "Kleen-heat" gas lighting and for gas refrigeration. The car is now available for further exhibition tours.

VICTORIA

Standard-gauge construction

Details of how standard-gauge trains will be brought through the metropolitan area to Melbourne were given recently by Sir Arthur Warner, the Minister of Transport. The route from Spencer Street Station to Broadmeadows will follow the east side of the present running tracks out of Spencer Street and, after crossing Dudley Street on the existing bridge, will begin to climb up to cross over the suburban lines by a flyover just on the Melbourne side of North Melbourne station. From there it will run in generally a straight line parallel to Dynon Road to the bridge now carrying the goods line over the Maribyrnong River. The two existing 5-ft. 3-in. goods lines from this bridge to West Footscray will be changed to combined 5-ft. 3-in. and 4-ft. 8½-in. gauges by the addition of a third rail to each track.

From West Footscray to Sunshine a new track of standard gauge will skirt the outside of the Tottenham marshalling yard. A new track will be built from Sunshine, on the north-east side of the present Sunshine and main Bendigo line, to Albion. One of the two existing 5-ft. 3-in. goods lines from Albion to Broadmeadows will be converted to standard gauge. At Jacana, the standard gauge route will cross the main north-eastern line, via a flyover, and link with the rest of the standard-gauge track.

NEW SOUTH WALES

New bogies for diesel trains

Riding characteristics of the new seven-car diesel train placed in service recently by the Government Railways on the "Northern Tablelands" express have been improved by alterations to the bogie suspension. Operation of these lightweight trains on the lighter type of permanent way as found on the Bombala branch has produced a slight degree of roughness when travelling at high speeds. This has been overcome by the use of integral cast-steel bogies fitted with outside bolster spring suspension. These bogies were supplied by A. E. Goodwin Limited.

Tests conducted by Departmental engineers during a trial run showed that movement of the car bodies was negligible at speeds up to and over 70 m.p.h.

OFFICIAL OPENING OF KIPEVU PROJECT



Sir James Farquharson, General Manager, East African Railways & Harbours, addressing guests at the opening of the new deep-water berths on February 3

INDIA

New Gandak River bridge opened

The new double-line metre-gauge bridge carrying the North Eastern Railway over the Gandak River between Sonapur and Hajipur was officially opened on November 16 by the Chief Minister of Bihar. It is named the Jagjivan Bridge after Mr. Jagjivan Ram, Minister of Railways.

UNITED STATES

Mass-transit passenger mono-rail

The Seattle Century Exposition Corporation has accepted the tender of the Swedish firm, Alwac International, Inc., of Stockholm, for the installation of the first permanent mass-transit mono-rail system in the United States. It will connect Seattle's business centre with the

International Fair, a distance of 1.1 miles. The estimated cost is about £1,500,000. The structure will consist of a single continuous longitudinal concrete beam supported in the main by single piers, with a few double supports, and on it there will be "double-line" tracks for the running of pneumatic-tyre wheels. Initially there are to be two trains each of four coaches on this type of wheel, electrically powered, which are expected to complete the journey in 96 sec. Two such trains will be able to carry 8,000 passengers an hr., and the service will be operated by Alwac who will receive all fares plus 25 cents from each admission ticket.

Wagon repair depot

The Chicago, Milwaukee, St. Paul & Pacific Railroad Company has opened a \$1,000,000 freight wagon repair shop at its Bensenville yard near Chicago. The shop is designed for automatic operation in conjunction with the yard's electronic retarder and classification system. The

wagons move through the shop on an assembly-line system, resulting in a reduction of waiting time.

HOLLAND

Revenue in 1960

The Netherlands Railways expects a profit, equal to that of 1959, of about 10 million guilders for 1960. Total revenue has increased by 4 per cent and costs, mainly due to higher wages, by 3 per cent.

IRAQ

Soviet aid for line construction

The agreement on economic and technical co-operation between the U.S.S.R. and Iraq, recently ratified in Moscow, provides for the construction of a railway line between Basra and Baghdad, which will link the Iraqi capital with the southern areas of the country. The agreement

also provides for Soviet aid in the erection of shops for the assembly and repair of railway wagons and the maintenance of diesel locomotives, as well as assistance in building a plant for the manufacture of concrete railway sleepers. At the request of the Iraqi Government, the U.S.S.R. has granted Iraq an additional credit of 180 million roubles.

ARGENTINA

Locally built Fiat motor coaches

Materfer, the Argentine subsidiary of Fiat, has delivered to the State Railways the first of the 240 diesel-hydraulic motor coaches to be constructed in its plant at Ferreyra, Province of Cordoba. These units have 12-cylinder horizontal Fiat engines developing 660 h.p. at 1,500 r.p.m. Maximum speed with full load is 75 m.p.h., and weight in working order is 50.8 tons. A six-unit train can accommodate 600 passengers.

PUBLICATIONS RECEIVED

Les Locomotives 230B P.L.M. By Lucien Vilain. Uzès (Gard) France: Editions de la Capitelle. 10½ in. x 8½ in. 8 pp. Paper covers. Illustrated with photographs and line drawings. Price NF. 4.50 (postage extra). This monograph describes a numerous and efficient class of 4-6-0 introduced early in this century by the former Paris Lyons & Mediterranean Railway; some were built by Henschel. There are notes on their history, duties in many parts of the P.L.M. system, and performance, and on modifications to individual engines.

Locomotives of the Great Western Railway. Part 8: Modern Passenger Classes. Published by the Railway Correspondence & Travel Society and obtainable from the Hon. Publications Officer, N. J. Claydon, 19, Dene Court Road, Olton, Solihull, Warks. 8 in. by 6 in. 40 pp. plus 24 pp. plates. Paper covers. Price 9s. This reprint of the eighth part, first published in 1953, of the extensive history covers all the Great Western Railway 4-4-2 engines, the only 4-6-2, *The Great Bear*, and all the 4-6-0s except Nos. 36 and 2601 (designed by Dean). The information is well presented. Despite early standardisation on the G.W.R., there were, as the book shows, great variations in each class.

This Is United Steel. This handsomely produced publication of the United Steel Cos. Ltd. describes briefly, in 55 pages, the activities and organisation of the group. The many illustrations in colour and monochrome depict steel-making processes and some of the many pro-

ducts. Among the latter are a 400-h.p. "Janus" type diesel-electric locomotive designed and built by the Yorkshire Engine Co. Ltd., and a locomotive wheel and axle assembly by Owen & Dyson Limited. Processes illustrated include rail making and inspection by the Workington Iron & Steel Company, which supplies rails and allied equipment to railways throughout the world, and nearly one-third of British Railways permanent way requirements; wheel manufacture by Steel, Peech & Tozer; and machining of solid forged railway wheels by Owen & Dyson. Group output in 1958-59 included 5.2 million tons (a record) of iron ore and nearly 100,000 tons of rails. Copies are obtainable from the United Steel Cos. Ltd., The Mount, Sheffield, 10.

Summary Sheets of British Standards for steel. The British Iron & Steel Federation has published three new summary sheets; these deal with "Steels for General Structural Purposes" and summarise British Standards Nos. 15, 548, 2762, 1775, and 3014. They are additional to the six summary sheets relating to "Steels for Railway Purposes," which summarise B.S. Nos. 11, 47, 500, 468, and 24, parts 1, 2, 3A, 3B, 4, and 6, published and distributed in 1959. The B.I.S.F. also announces cancellation of its summary sheet 3A, which summarises B.S. Nos. 11, 47, and 500; this is because of B.S.I. amendments to the 60N flat-bottom rail and fish-plate. The summary sheet No. 3A has been re-printed and circulated. All these B.I.S.F. summary sheets have been widely distributed throughout the world

in appropriate languages, but additional copies can be obtained from the British Iron & Steel Federation, Steel House, Tothill Street, London, S.W.1, in one or other of the following versions: English (British or metric units), Spanish Portuguese, French, and German.

Vurig Spoor (Track of Fire). By Henri Asselberghs. Obtainable from the Netherlands Railways Museum, Utrecht. Price 2 guilders. This 110-page illustrated guide to the Railways Museum at Utrecht shows the comprehensiveness of the collection, of which the author is a former Director. Practically all spheres of railway activity are represented. There are actual locomotives besides scale models. The well-arranged pictures and prints include many contemporary works illustrating early railway history in Britain. The historic interest of the locomotives and rolling stock of the several railways which have been amalgamated into the Netherlands Railways is great, and it is a pity that the catalogue does not name the British and other builders.

Holidays for the Motorist. The 100-page illustrated programme of the Autotravel Department of Thos. Cook & Son Ltd. offers 58 inclusive tours by private motorcar in many regions, among them Corsica, Greece, and Morocco. Several tours include conveyance by French National Railways car/sleeper trains. Autotravel Department services include reservation of space in car/sleeper trains, steamers, and aircraft, besides hotel reservations, itineraries, insurance, and so on.

THE WAY AHEAD in the North Eastern Region

Internal and external co-operation demanded and achieved in carrying out modernisation and development in all departments

by F. C. MARGETTS, Assistant General Manager (Traffic), North Eastern Region

THROUGHOUT 1960, the traffic content of the Modernisation Plan for the North Eastern Region was described in articles in this journal. Reading these, one might have concluded that only traffic considerations prevailed. One might have thought, too, that a long time had elapsed since 1955, when the Modernisation Plan was launched. If the Regional portion of the whole plan as originally conceived was sound, if the results expected to be derived from it were so promising, if there was a clear idea in the minds of railway officers of what was required in particular fields, then, one might have asked, "Why were the plans not ready earlier, and why has progress not been more rapid?"

Overall progress

The answer is twofold. First, planning and progress has *not* all been in the traffic field as earlier articles might have implied. Secondly, it must never be thought, because the B.T.C. plan was not published until 1955, that plans had not been made and acted on in earlier years. The pre-1955 position in the North-East in some fields of progress is worth reviewing briefly before reference is made to its expansion, which has been so ably described by other writers in more recent years. Even more interesting, now that the major parts of the plan are finalised, will be to follow the physical progress.

One of the principal features of the Modernisation Plan has always been the improvement of track and signalling. In these fields, the North Eastern is fortunate. Foresight in the past has made it unnecessary, except at one particular place, to increase track capacity by constructing additional running lines. Track improvement works have been steadily pursued for over ten years. Stronger and stiffer rails have been used on extensive mileages of heavily-worked lines. The ballast bed supporting the track has been made deeper wherever this could be done. Troublesome sections of soft track formation have been dug up and remade. Effective drainage has been provided.

Some old, big and important bridges have been strengthened. Some key junctions and fast running curves have been remodelled. Track maintenance and renewal work has been highly mechanised.

New machines have been developed for some of the work.

Research and experiment has led to development in many fields of reliable designs, equipment, and practices. All this, and more, has not been the consequence of the Regional Plan but a major contribution to conception of part of it.

The route-relay signal box at York, opened in 1951, was then one of the largest of its kind in the world. It set a pattern which led to further progress. The signalling concentration at Newcastle, the modernisation at Huddersfield, the extension of colour-light signalling on principal main lines—all these and other similar projects were developed and plans laid before the Modernisation Plan was published.

These steps forward, although intimately related to traffic operation, were planned and carried out by the technical officers responsible ahead of the emergence of the main body of the "Traffic" plan. The first real step forward in the traffic field was also taken nine years ago when the Region decided to convert most of its local and cross-country passenger services to multiple-unit diesel operation. This is now nearly completed. Concurrently maintenance depots were planned, conversion of steam depots in whole or in part effected and, at the same time, a number of the latter were modernised with the future in mind.

Accelerated activity

So the preparation and publication of the Modernisation Plan did not mean that there had been a period of inertia beforehand. It might be thought that, except for track and signalling modernisation, except for dieselisation of passenger trains, and some other features including motive power depot modernisation, the progress made in the Region might have been greater. This would not be acceptable, although it is admitted that within the past three years planning and subsequent action have been accelerated. It could be said that to some extent the technical officers, who have formed such a vital part of the Regional team for the development of the Modernisation Plan, have been waiting for much of the traffic conception of requirements to be finalised.

There were sound reasons why earlier

action was not taken. The geographical position of the North Eastern Region and the directional flow of its traffic naturally meant that attention had to be paid to what other Regions were doing. Clearly, anything on a major scale like the marshalling yard plan had to be related to the intentions of the Eastern, London Midland, and Scottish Regions. Similarly, the substitution of diesel locomotives for steam locomotives was the concern of many Regions according to their participation in the particular train working.

Next, it was imperative that there should be full and reasonably accurate knowledge of the long-term intentions of the major industries. Any railway developments in the North-East had naturally to be related to the developments and trends in the coal, iron and steel, ship-building, fertiliser and chemical industries.

Gaining from others' experience

In some cases, it was deemed advisable to enquire into results achieved in particular fields elsewhere, i.e. retarder development in marshalling yards. Clearly, it was sensible to learn from experience gained at Thornton and Temple Mills marshalling yards. Put simply, wasted effort had to be avoided both in traffic and technical fields.

Finally, though the shape and size of the railway system has even now not been finally determined, at least some idea of what it would look like in the North-East had to be obtained to enable the major planning to be finalised and the earlier advances described in the opening of this article had to be welded into a consistent advance on to a wide front by all interested departments.

The merging in 1957 of the previously separate Commercial, Operating and Motive Power departments into a unified traffic organisation with decentralisation as one of its aims, contributed considerably towards advancement of the North Eastern Modernisation Plan. The setting up of a virile central planning section responsible direct to the Assistant General Manager (Traffic) but with lines of consultation to his principal officers, provided a central traffic driving force intimately linked with all the technical departments.

From that time onward, as knowledge of other Regions' intentions increased, as plans of the big industries emerged, as new developments in the technical fields became available, a consistent plan advancing on a common front was evolved.

This work has not been the conception of a single mind or a single department. Everyone in the Region has worked as a member of a team. Out-of-date ideas about the separateness of what have sometimes been termed the "using" and "spending" departments were, if they ever existed in the North-East, discarded long ago. Train services cannot be satisfactorily operated without the great advances which have been made in all the engineering fields. The attainment of perfection in planning calls for team work of the highest order and it may be pertinent to mention that contributions of consequence are made by our Estate and Legal friends.

Elasticity of concept

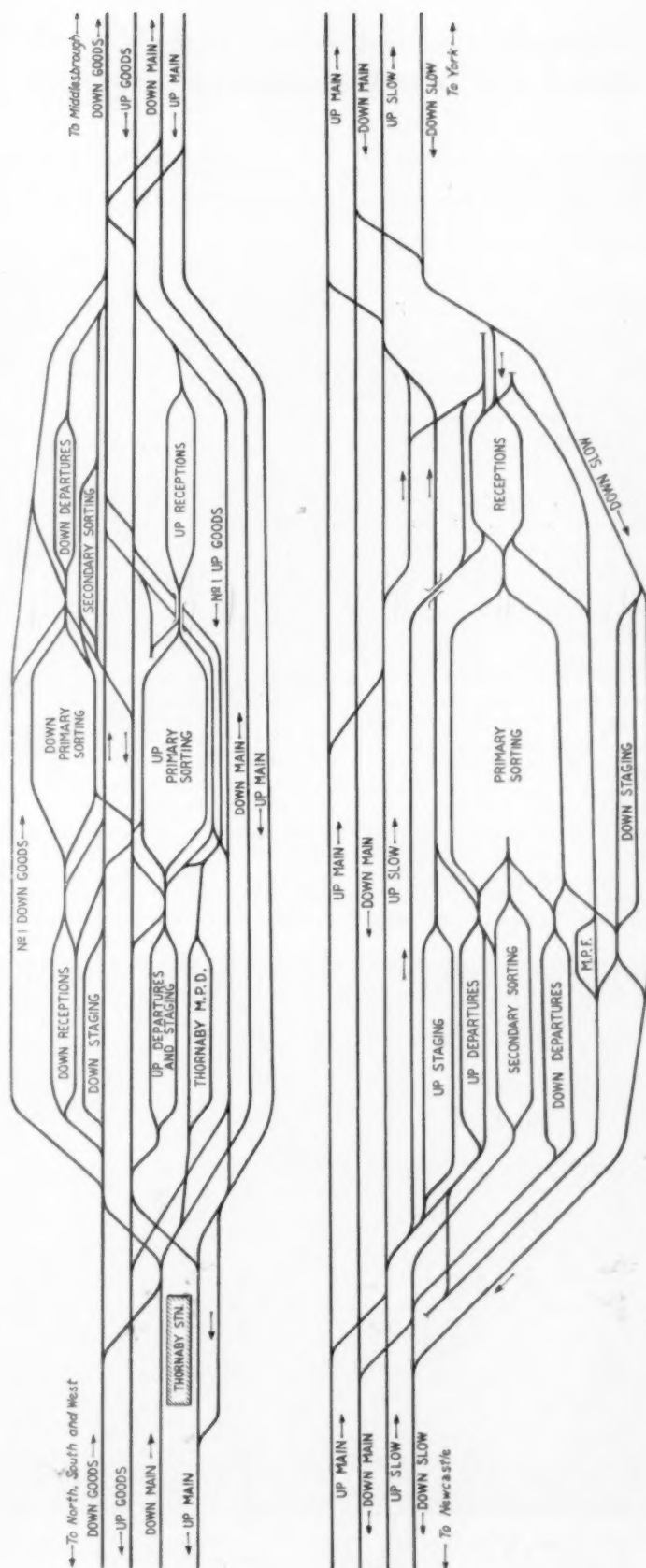
This article has been written in the hope that some idea can be conveyed as to how the total plan for the North Eastern has evolved. There will be additions to be made to it. New ideas will undoubtedly be forthcoming. The primary object now is to drive on to completion the schemes which have been authorised so that the benefits can be obtained as quickly as possible, not only for the railway but also for users. The growth of the iron and steel industries, the expansion of the fertiliser and chemical industries, the relentless drive to stem the swing away from coal, the expanding economy of the country, the growth in travel at all levels—these and other factors make it imperative that there should be no slackening in the drive to attain the final objective.

In subsequent articles, officers connected with the principal technical departments in the Region who have been concerned from the outset with the planning of the major requirements and others who, in some cases, are now actively concerned in the construction field, will describe how the physical implementation of the plan is going ahead. They have a major task before them.

Co-operation essential

In some cases, the work can go ahead uninterrupted by traffic considerations. In other cases, an expanding traffic has to be worked concurrently with major construction work. Just as all concerned co-operated at the inception in planning and design, so must there also be similar co-operation towards the end.

In closing, it would be pertinent to mention with appreciation the efforts which are evident on all sides by the men on the ground who must work traffic while construction takes place around them.



Simplified representations of two examples of marshalling yards under construction in the North Eastern Region (above): Newport new yard; (below): Lamesley new yard

Altitude test on "90" class diesel-electric locomotive

EAST African Railways & Harbours recently carried out an extensive altitude test with a new "90" Class diesel-electric locomotive over the 500 miles of track from Mombasa to Timboroa Summit (9,136 ft.). Not only did this test give the E.A.R. & H. a unique opportunity for checking the performance of the "90" Class in practice, but provided the manufacturer of the locomotive, the English Electric Co. Ltd., with valuable information on the performance of the engine and turbo blower under such conditions.

The reason for the fall-off in power in an internal combustion engine at high altitudes is the rarified air, and hence a dwindling supply of oxygen with which to burn the fuel. In consequence less fuel can be burned per stroke and the power of the engine drops. This trouble is not experienced with the steam locomotive. The power of the locomotive remains the same at any altitude.

Overcoming loss of power

With the advent of the internal combustion engine on railways, ways and means of overcoming loss in power at high altitudes had to be found if the locomotives were to be effective on railways such as in East Africa. The steam locomotive has, from its inception, provided its oxygen by the exhaust through the chimney. This creates a vacuum and hence draws air through the fire.

The latest development in the diesel

engine field is on the same principle, namely that the exhaust is used to provide oxygen to suit the varying requirements of the engine. The exhaust from the engine is led into a gas turbine which

in turn drives a blower (supercharger) and provides air at a maximum pressure varying between 2-9 lb. per in. depending on the speed and power demand into the engine intake. This apparatus is known as a turbo blower.

Action of turbo blower

As with the steam locomotive this arrangement is self compensating to a very large extent; that is, under light loads the exhaust gases drive the turbine slowly and provide a lesser amount of air to the engine intake. As the engine is brought up to full power the exhaust gases drive the turbine at an increasing rate, with a corresponding increase in the amount of air delivered to the engine intake. There are other important features in the system, such as the after cooler, which ensures that the air being blown is made reasonably cool by the time it reaches the engine intake.

In theory the "90" Class locomotive, which is fitted with these refinements to its engine, should thus be able to sustain its rated horsepower between Mombasa and Timboroa (9,136 ft.). In practice a trial has never been carried out because no railway using English Electric locomotives climbed to such altitudes.

A trial run with locomotive 9003 with a 600-ton load was arranged. The trial was

Continued on page 195

Performance tests carried out on East African Railways over 500 miles of track from sea level to 9,000 ft.



Test train leaving Nakuru Station hauling 600 tons of goods traffic



Mr. H. Gill, English Electric Co. Ltd., left, and Mr. J. Hudson, Chief Mechanical Engineer, E.A.R. & H., taking engine readings on the footplate

PASSENGER ROLLING STOCK for Commonwealth Government Railways

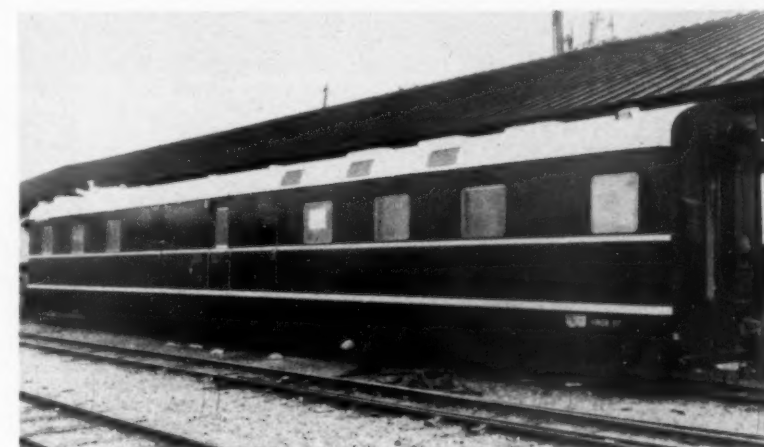
A NUMBER of interesting features, some of them new to Australian railway practice, are included in the series of passenger rolling-stock recently delivered to the Commonwealth Railways for operation on the Trans-Australian Railway between Port Pirie and Kalgoorlie. The stock, which has been built by the Kinki Sharyo Company of Osaka, Japan, consists of four second-class sleeping cars, two second-class sleeper/lounge cars, two power vans, and four brake and crew vans.

Body and underframe construction

Fabricated construction from steel plate, sections, and sheet to Japanese Industrial Standards is used for the body and underframe. The underframe is built without centre sills, the draft sills and underframe ends being designed to transfer buffing and drawgear stresses to the side frames.

The adoption of two-berth sleeping compartments represents a departure from existing practice on this railway, wherein provision for four-berth second class compartments has hitherto been made. In effect, the new accommodation consists of two-berth roomettes, based on the existing design of roomette, with the addition of an upper berth and a permanent seat. To use the available space to the best advantage, the layout of the accommodation includes staggered corridors, and compartments of trapezoidal shape in plan, with the berths arranged longitudinally.

When the compartment is arranged for



General view of brake and crew van

day use, the lower berth is pivoted to stand in a vertical position against one of the transverse partitions, while the upper berth is lifted to a horizontal position just below the ceiling of the compartment. Two seats are arranged facing each other with a small folding table, secured to the outer wall, between them. The seats are upholstered in moquette, coloured in rust-red and in bright green in alternate compartments.

To convert the compartment for night

use, the seats are collapsed to allow the lower berth to be swung down to the horizontal position. The upper berth is lowered to its correct position by a chain and sprocket mechanism operated by a handwheel, the berth remaining horizontal throughout the movement. Plastic curtains are attached to the ends of the berth to protect the bedding from the operating chains and to screen the mechanism from the passenger's view.

Compartment fittings

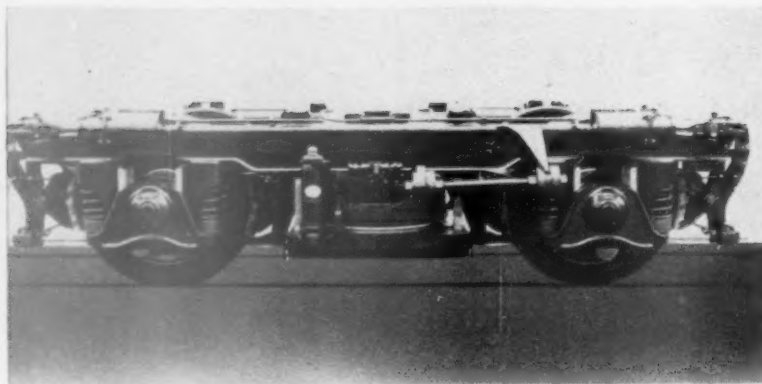
Sponge rubber is used for the mattresses, and for the cushions, back and arm-rests of the seats. A stainless steel washbasin is fitted, and arranged for folding out of sight behind a hinged panel when not in use. Other fittings include a cabinet below the basin to house a waste receptacle, a toilet shelf, mirror complete with light, electric shaver socket and a luggage rack. Separate wardrobes are provided for each passenger, while heavy luggage is accommodated in a lock-up cupboard at the end of the corridor.

Lounge car

In the lounge section of the sleeper/lounge cars, the seating is arranged alternately in the form of curved settees facing towards the centre gangway and pairs of seats facing each other on either side of the gangway. Small tables, which fold into the outer wall under the windows, are arranged between the seats, and movable occasional tables are pro-



Lounge compartment of sleeper/lounge coach



Bogie, showing pneumatic bolster spring

vided for passengers using the settees. The colour scheme is designed to present a bright and pleasing appearance, and consists of carmine seat upholstery, blue vinyl floor covering, maple laminate walls, and white ceiling.

Automatic door control

A feature which has been introduced for the first time in Australian passenger rolling-stock consists of an automatic door-mechanism controlling the operation of the door leading from the lounge to the corridor. It is operated by a floor switch beneath a rubber mat on the lounge side, and by a touch switch on the corridor side. The mechanism comprises a motor-driven hydraulic pump and accumulator which supplies hydraulic pressure to a door-actuating cylinder. When a passenger steps on the mat the door is immediately opened away from him, similarly the door opens away from a

passenger entering from the corridor.

The cars are equipped for air-conditioning and, in conjunction with this system, the windows are double-glazed with metal venetian blinds fitted between the panes and operated by small winding handles. The glass is of the laminated safety type. All the interior lining is formed of plastic laminate, a maple-wood grain finish being used for the walls of the compartments and the lounge. In the corridors a dark green panel is adopted for the lower portion of the walls, with a wood grain finish for the upper. White laminate, attached to a thin aluminium sheet, is used for all ceilings.

The supply for all general lighting in the sleeping, sleeper/lounge, and power cars, which is fluorescent, is at 240V., a.c., 50 cycles. The main lighting in the lounge is provided by a continuous series of fluorescent lamps, housed in troughs above the windows, giving indirect

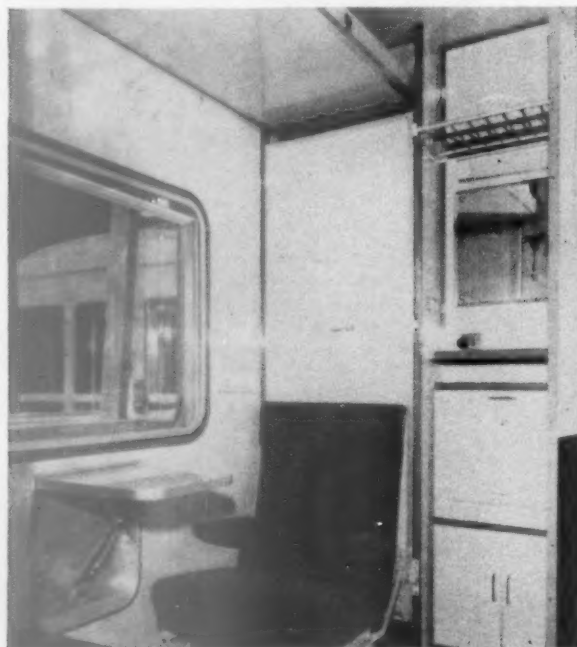
illumination. In addition, five circular fluorescent lamps are arranged in a central ceiling panel, as well as four vertical lamps mounted on the walls. Besides the main fluorescent tube in each sleeping compartment, small fluorescent reading lamps, supplied at 100V., a.c., are provided, while a blue night-light is incorporated in the main lighting fitting.

Corridor lighting consists of ceiling lamps, and low level lamps for floor illumination when the ceiling lamps are switched off. Illuminated berth numbers and conductor's call lamps are situated at each compartment door; these are on a 24-V. d.c. circuit, fed through a rectifier from the main supply. A radio loud-speaker system is installed, over which news and musical programmes may be relayed; this is augmented by ear-horns in the sleeping compartments to enable individual passengers to listen-in without disturbance to their neighbours.

Bogie construction

Most of the cars are equipped with cast-steel framed bogies of the "Commonwealth" type, supplied by Bradford Kendall Limited, of Alexandria, New South Wales, but two cars are mounted on bogies of a type produced by the coachbuilders. With fabricated frames and bolsters, this bogie is of the swing-bolster, independently-sprung type and includes a new feature in the form of pneumatic bolster springing. The swing links, which are 27 in. long, are designed to give comfortable lateral conditions in the car and the side bearers are spring-loaded. A large hydraulic shock-absorber is located at each end of the bolster.

The pneumatic spring arrangement



Left: sleeping compartment in day position, and right, compartment with both berths in position

consists of a corrugated rubber bellows approximately 2 ft. mean dia. and $6\frac{5}{16}$ in. high in service position, restrained by two steel rings, and placed between the bolster and the spring plank. The bellows pressure, which is nominally 50 lb. per sq. in., can be adjusted to suit the load, and is graduated through a levelling valve placed at each end of the bolster so that the nominal distance between the top of the bolster and the underside of the frame is $1\frac{1}{8}$ in. At this position, the clearance inside the bellows is the same, and any increase in one means a corresponding decrease in the other.

Automatic level adjustment

The car level is automatically adjusted by the levelling valve, which is actuated by a lever attached to the spring plank. Any excessive list to one side or the other is corrected by this valve which admits more air to the side of the bolster being depressed, and releases air from the high side. A four-second time-lag is introduced to protect the equipment and the air-supply from constant operation. The air-supply is taken from a separate reservoir fed from the train line, through a governor valve, and kept up to maximum train line pressure, as required. A non-return valve prevents feed-back to the train line.

As a safeguard in the event of failure of air supply or leakage in the bellows, a large rubber bumper, 10 in. dia. and 2½ in. high, is provided inside the bellows attached to the spring plank, capable of supporting the weight of the body. Tests with this arrangement have indicated that, although the riding qualities are inferior to those under normal conditions of air support, the comfort of the passengers is not greatly impaired.

To enhance the stability of the car the body is supported on the bogies at a very low point, the bolster height at the centre plate being 19½ in. above rail level. Bolster anchors contain the bolster in its normal position, and one shock absorber is fitted between the frame and bolster in a horizontal position to dampen any excessive lateral swing of the bolster. Differential lateral movement between spring plank and bolster is prevented by stops. The fabricated frame, which has no end sills, is supported on the axlebox coil springs through heavy rubber buffers. Pedestal wear guides are in anti-friction resinous material. The axleboxes are SKF pattern with bearings of the standard size in use on passenger and freight rolling-stock on the Commonwealth Railways. One 6-in. dia. by 8-in. stroke brake cylinder per wheel is fitted, and each wheel has two brake blocks.

The design and layout of the power vans follow closely those of earlier vans, except that the guard's look-out has been omitted. The power equipment, which is installed by the railway in its Port Augusta workshops, consists of two

GM. Series 6-71 diesel generator sets of 75 kVA. output, to supply the lighting and auxiliary power requirements of the train.

The power vans are arranged to give accommodation to the train crew, including the dining-car staff. The crew compartments are fitted out for four men, for each of whom a separate wardrobe is installed. A pedestal wash-basin, with a cover which serves as a small table, is placed below the window. Ventilation consists of cooled, filtered air supplied by a mechanically refrigerated sealed unit air-cooler mounted in the ceiling, of a type in extensive use in Japanese rolling-stock. Fresh air is drawn in from the outside at one side of the roof, and used air is exhausted at the other.

Windows and venetian blinds are similar to those in the passenger cars. The seating upholstery is rust-red moquette, and the compartment and corridor floors are covered with green vinyl. Maple-grained laminate is used for lining the walls of the guard's and crew compartments and the corridor. The amenities for the crew include the provision of a shower-room with hot and cold water.

Crew accommodation

The brake vans also have crew compartments, with facilities similar to those in the power vans, with the exception of the ventilation. As these vans will not normally be coupled to the power vans, unit air-coolers cannot be used, and, in their place, large oscillating fans are mounted on the ceiling, operated from a 24-V. battery supply.

Seats are covered in red leather, and the windows are of the half-lift type in aluminium frames with spring-roller blinds of fibre-glass material.

The van contains a large kitchen/dining compartment for the crew, equipped with liquid-petroleum gas-operated stove, and refrigerator, stainless-steel sink and draining-board, cupboards and racks. Seating for four is arranged at a laminate-topped table, and oscillating ceiling-fans are fitted. The walls are lined in oak grain laminate and the floors are in green vinyl.

A separate two-seat compartment is provided to accommodate drovers who accompany cattle trains on the Central Australia Railway. A separate door gives access to this compartment from the ground, and another door leads to the interior of the car.

The lighting supply is taken from batteries charged by Stone's axle-driven generators, type XR-29.S.

Rubber-mat draft gear and slack-controlled automatic couplers are used, supplied by Bradford Kendall Limited, and the air brake and water-raising equipment are supplied by Westinghouse Brake Co. (Australia) Ltd. for

all cars. The passenger cars are equipped with Stone air-conditioning equipment.

Altitude test on "90" class diesel-electric locomotive

Concluded from page 192

to take place over a distance of 500 miles, ranging from the tropical heat of Mombasa to the rarified air of Timbora, 9,000 ft. above sea level. As it would be necessary to man the instruments over the whole 24 hrs. it was decided to have six people on the actual trial, three from the English Electric Co. Ltd., and three from the Chief Mechanical Engineer's Department.

Mr. H. Gill of the English Electric diesel engine division; Mr. J. Welch, English Electric traction representative in East Africa; and Mr. M. Sedgely of the company's electric traction department, formed the English Electric personnel. The East African Railways staff were Messrs. D. M. S. Fairweather, District Mechanical Engineer (Design); M. Heery, Design Assistant; and R. M. Davies, Senior Mechanical Engineer, who was in charge of the trial.

It was decided to take readings at intervals of 500 ft. from sea level to 9,000 ft. and a good deal of planning was necessary beforehand to obtain sections with the requisite altitude, and with sufficient lengths of ruling gradient to establish stable engine conditions. A comprehensive range of readings was taken. These included speed, drawbar pull (through a hydraulic dynamometer fitted to an inspection coach), engine speed, altitude, relative humidity, exhaust temperatures at various points, air temperatures at various points within the engine, water temperatures at various points and oil temperatures. In addition barometric readings were taken at intervals to cross check the altitude readings.

The engine and turbo blower came fully up to expectations. A tractive effort of 19,500 lb. at a speed of 19 m.p.h. at sea level was matched by a tractive effort of 19,500 lb. at 19.5 m.p.h. at Mile 69/14 near Timbora Summit, an altitude of 9,000 ft. As anticipated the turbo blower compensated for altitude speeding up. The net result of this was a higher boost pressure at 9,000 ft. than at sea level, the relative figures being 9½ lb. per sq. in. at 9,000 ft. as compared with 8 lb. per sq. in. at sea level.

The other point which was being closely watched was the rise in the exhaust temperature at the turbine inlet. This is really the critical feature in altitude tests of this type. The temperatures at the turbine inlet rose from 960 deg. F. at sea level to 1,180 deg. F. at 9,000 ft. If the engines were to be worked regularly at 9,000 ft. this might necessitate slight derating to bring down the temperature to approximately 1,100 deg. F.

Power station development on the Great Northern Line

IN PURSUANCE of its major plan for development the Central Electricity Generating Board sought, in March last year, the consent of the Ministry of Power and the County Council to the establishment of a generating station on a site of approximately 550 acres at West Burton, east of Retford, in the County of Nottinghamshire, comprising :—

- (i) Installation of coal-fired boilers and generator plant having an electrical output of approximately 2,000 MW.
- (ii) construction of necessary buildings and civil engineering works.
- (iii) construction of eight reinforced concrete cooling towers.

The intake of coal will be of the order of 5.3 million tons a year, a quarter of which would be consumed between March, 1965, and March, 1966, increasing through 1966-67 until full consumption is reached in March, 1968.

Layout of sidings

In discussions between the Central Electricity Generating Board and the Line Traffic Manager's officers of the Great Northern Line respecting the permanent way layout serving the power station together with other relative matters, it was considered that the conventional type of sidings layout should not be adopted, but that a "permanently-coupled scheme" layout should be adopted.

The main feature of this scheme is that trainloads of coal would be discharged on arrival and siding accommodation would be kept at a bare minimum with considerable saving in capital expenditure and maintenance costs. On the railway side, fewer wagons would be required to move a given tonnage. The co-operation of the National Coal Board was sought and consultations sub-

Permanently-coupled scheme layout with trainloads of coal discharged on arrival and minimum siding accommodation

by R. T. MUNNS

sequently took place between the three industries to work out and put the principles in practice.

Movement of coal

The most important consideration in the joint discussions was the recognition that the Coal Board produced in five days, the railway moved in six days, but the Central Electricity Generating Board consumed for seven days. The hiatus at the colliery was bound to create a hiatus elsewhere and this was overcome by the power station authority's agreement to pick up from stock during the weekend. Stock coal at the power station would normally equal from three to six weeks' consumption.

Wagons for the coal will be of the 24½-ton or 21-ton hopper bottom type.

When in full consumption, West Burton could well be the largest thermal power station in Europe, accepting some 22 trains of coal per full working day. These block loads will leave individual collieries or adjacent railway concentration points, run over the hopper gantry at the power station with an almost concurrent discharge and return to the collieries without a change of engine, brake-van or crew. Present planning allows for six-wagon-length hoppers, which means that six wagons can be discharged at a time.

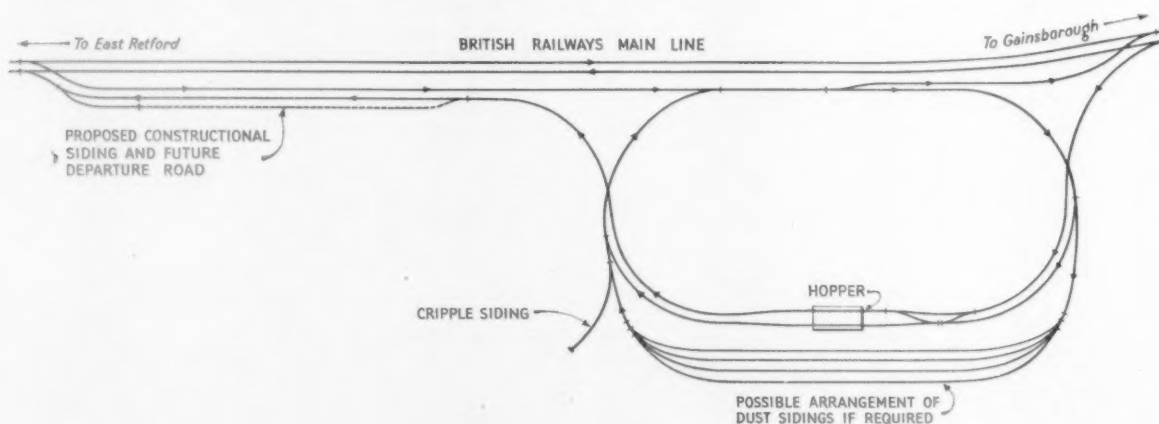
Railway research is being made into the design of equipment which would automatically release the bottom doors and close them again as each raft of six wagons passes over the hoppers. It

is estimated each train will take only 40/45 min. from entering to leaving the power station. Meanwhile completing the full circuit including discharge over the hoppers, a process which can be followed by reference to the diagram. This is a tentative and not a final plan. It is envisaged that the trains will be hauled by diesel locomotives of the type "4" range (2,000—2,500 h.p.) or by two type "2" (1,365 h.p.) in multiple. Most will pass via Retford and necessitate the provision of a fly-over to replace what is known as the "straight line"—where the Manchester - Sheffield - Cleethorpes line crosses the East Coast main line on the same level. The remaining trains will approach from and return to the Gainsborough direction.

Provision is being made for a short cripple wagon siding, emergency means of discharging wagons other than at the track hoppers, a permanent siding for operational workshops and stores, a weigh-bridge, and separate sidings if necessary for the handling of the residual ash or dust the volume of which is reckoned to be 20 per cent of coal tonnage intake.

Signalling

The plan provides for the whole of the power station running track to be signalled and operated by a modern signalbox, except for track over the hoppers. This is to be controlled by Central Electricity Generating board staff working in conjunction with the signalman and trainmen.



Permanent way layout serving the power station at West Burton

PERSONAL

British Railways

MR. A. C. B. PICKFORD, Assistant General Manager (Traffic), Western Region, British Railways, who is retiring from service, began his career with the Great Western Railway Company in 1915. After obtaining experience at stations and district offices in South Wales, he was appointed to the Staff Department at Paddington as an Outdoor Investigator in 1929. Appointed Personal Secretary to the Chief Goods Manager in 1932, he became Goods Agent at Slough



Mr. A. C. B. Pickford

in 1934. On Mr. Pickford's return to Paddington in 1937, he became a member of the Commercial Research Department, and represented the Great Western Railway on liaison committees with the Ministries of Food and Supply; he also was a member of the Freight Rolling Stock Centralised Committee. In 1941, he was appointed Rates Assistant (Research) to the Chief Goods Manager, and, in 1943, District Goods Manager at Swansea. Transferred to Cardiff as District Goods Manager in 1945, he was appointed South Wales Area Assistant to the Chief Goods Manager in 1947. On the formation of the Railway Executive in 1948, he returned to London as an Executive Officer of that body, being Chairman of the Terminals Committee. He was appointed to the then new position of Assistant General Manager (Traffic) Western Region, British Railways, in January, 1958. A member of the Council of the Institute of Transport, and of the Council of Institute of Materials Handling, Mr. Pickford led a team to visit America in 1950, with special reference to freight handling. He also was a member of the Winter Transport Conference and represented British Railways with the International Union of Railways and the International Container Bureau.

MR. J. G. URQUHART has been appointed District Traffic Superintendent, Perth, Scottish Region, British Railways.

MR. A. S. KIRBY, Assistant (Productivity & Work Study) to the Operating Officer, Euston, London Midland Region, British Railways, retired on January 31 after 42 years of railway operating service.

MR. H. E. SMITH has been appointed Publicity Assistant in the department of the Public Relations & Publicity Officer of the Eastern Region of British Railways. He succeeds MR. J. C. SEWTER, who has retired.

Overseas

MR. E. P. ROGAN has been appointed a Commissioner of the Victorian Railways.

MR. K. A. SMITH, formerly Chief Mechanical Engineer, who has been acting as Commissioner for Commonwealth Railways since April last year, has been confirmed in that appointment.

MR. N. R. QUAIL, Deputy Chairman of Commissioners, Victorian Railways, retired at the end of December last. MR. W. GILMOUR, Secretary of the Board, and MR. L. G. DAVID, Chairman of the Staff Board, have also retired.

We regret to record the death following a car accident of MR. CHARLES D. EDSFORTH, Vice-President (Traffic), Canadian Pacific Railway. Mr. Edsforth, who was 55, was born in Accrington, Lancashire, in September, 1905. He joined Canadian Pacific as a clerk in 1923 at Saint John, New Brunswick, became Assistant to the General Freight Agent, Toronto, in 1941, District Freight Agent, London, Ontario, in 1947, and Assistant General Freight Agent, Vancouver,



The late Mr. Charles D. Edsforth

in 1948. He moved to Montreal in 1950 on his appointment as Assistant to the General Traffic Manager, and was promoted to be Assistant General Traffic Manager in 1954, General Traffic Manager in 1958, and Vice-President (Traffic) in September, 1959.

MR. MALCOLM H. ARCHER, Public Relations Officer, East African Railways & Harbours, who, as recorded in our February 10 issue, has been appointed Kenya Government Public Relations Officer in London, was educated at Aldenham. During the last



Mr. Malcolm H. Archer

war, he spent three and a half years in Kenya doing welfare and information work in Nyanza and Central Province. Later he served in Nairobi as Assistant Public Relations Officer, East Africa Command. In this capacity he toured Tanganyika. Mr. Archer accompanied the Eleventh (E.A.) Division to Ceylon and Burma as Officer-in-Command of the Thirteenth (E.A.) Information Platoon. From 1946 until he went to Nairobi, he was Publicity Manager for a trade association, Editor of *Philately*, Advertising & Sales Manager for an old-established furnishing company, and Publicity Manager for the John Lewis Partnership, which position he resigned to take up his appointment with the East African Railways & Harbours. His work with E.A.R. & H. has involved the building-up of a Public Relations Office that now comprises an advertising and exhibition section, a press and broadcasting office, a photographic unit, and a film unit. Mr. Archer is a Member of the Institute of Public Relations.

MR. L. A. W. HAWKINS, Assistant General Manager (Operations) Designate, Rhodesia Railways, is to proceed overseas on secondment to assist in discussions with the proposal to build a railway in Swaziland. Mr.

Hawkins assisted at discussions on this subject recently both in Swaziland and London. He will be away from Rhodesia for about three weeks and, if time permits, will include talks in London on the reorganisation of Rhodesia Railways.

Canadian National Railways announces that MR. AINSIE KERR has been appointed Assistant Director of Public Relations, and MR. HENRI GRAVEL has been appointed Manager of French Services.

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MR. I. THOMAS has been appointed Commercial Manager of New Zealand Government Railways in succession to MR. F. G. CULLING, who has retired after 40 years of service. Mr. Thomas has relinquished the position of Chief Administration Officer in the General Manager's office to take up his new post. He recently spent some time in Australia studying the operation of the "roll-on" ferry *Princess of Tasmania* and recent developments in railway commercial practice.

MR. K. K. MUKERJEE, Chief Operating Superintendent, Western Railway, India, who has become Chief Operating Superintendent of the Eastern Railway, joined the former East Indian Railway as Assistant Traffic Superintendent in 1936. He was promoted to the Senior Scale in 1944 and worked thereafter as Superintendent of the Railway School of Transportation at Chandausi and Superintendent, Transportation, on several Divisions. In 1944, he was posted as Senior Instructor, Transportation, at Railway Staff College at Baroda, where he served for about two years. He also



Mr. K. K. Mukerjee

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British Transport Commission

The British Transport Commission announces the following appointments:—

Finance Department

MR. J. J. FARQUHARSON, Traffic Costing Officer, Euston, has been appointed Traffic Costing Officer, B.T.C. headquarters.

Architect's Department

MR. T. E. MEDDINGS, Senior Assistant Architect, Civil Engineering Department, British Railways, Western Region, Paddington, has been appointed Sectional Architect.

British Railways Central Staff

MR. A. GRANVILLE, Assistant to Assistant (Rates & Sales), Office of Commercial Officer, British Railways, Western Region, Paddington, has been appointed Assistant Freight Officer (General).

Industrial

MR. I. KEITH has been appointed to the board of the British Moulded Hose Co. Ltd.

Martonair Limited has announced that MR. M. R. TAYLOR has been appointed Technical Representative for East Staffordshire.

MR. B. A. THURGOOD, Morriston Branch Manager, George Cohen, Sons & Co. Ltd., has been appointed Resident Director, George Cohen Australian Scrap Co. Proprietary Ltd., Sydney.

MR. A. S. BLACK, a director of the General Electrical Co. Ltd. and Area Manager for Scotland, has retired. He is succeeded as Area Manager for Scotland by MR. J. S. LANGLANDS.

MR. S. A. GASKELL has relinquished his position as Chairman of Bruce Peebles & Co. Ltd., but will remain on the board of that company. MR. T. COUGHTRIE has been elected Chairman as from February 7, 1961.

MR. DENNIS W. GRAY, Works Engineer of Chamberlain Industries Limited and RICHARD R. WATKINS, General Sales Manager, have been appointed to the board of that company as Works Director and Sales Director respectively.

DR. ESMOND W. SMITH, an Advisory Director of Submarine Cables Limited, has retired. MR. ALBERT G. FULLER has been appointed Secretary of Submarine Cables Limited, in place of MR. WILLIAM F. NORTH,



Mr. G. F. Noakes

who has been appointed Personal Assistant to the General Overseas Manager of British Insulated Callender's Cables Limited.

London Transport Executive

MR. G. J. MYATT, Principal Costs Assistant (General), London Transport Executive, has been appointed Principal Accounts Assistant in the Chief Financial Officer's Department.

MR. G. F. NOAKES, Principal Stores Assistant, London Transport Executive, who, as recorded in our issue of January 20, has been appointed an officer of the L.T.E. with the title of Stores Superintendent, entered the Stores Department of the London General Omnibus Co. Ltd., in 1922. Before his appointment to Principal Stores Assistant, in June, 1957, he was in charge of the Stores Central Office of the London Transport Executive, and has acted as Deputy to the Supplies Officer.

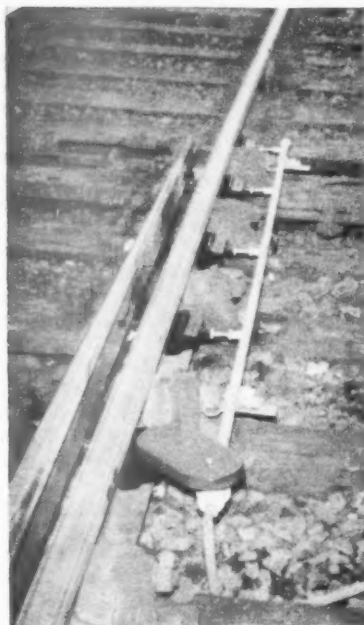
MR. J. WOOD, who has been appointed Principal Catering Assistant, London Transport Executive, joined the L.T.E. in 1949 as a Divisional Catering Controller. In 1957 he was promoted to be Senior Instructor & Inspector of Catering and two years later he became Outdoor Assistant to the Catering Officer. Before he joined the L.T.E. he had many years' experience in the catering trade, and has had wide experience in all aspects of industrial catering. During the war he served in the Royal Air Force with the rank of Flight Lieutenant, and part of this service was spent as Chief Instructor at the R.A.F. School of Cookery.

Road

We regret to record the death of MR. D. HAYS who, until his retirement, in 1949, was Director & General Manager of the Midland General Omnibus Co. Ltd.

MR. W. T. JAMES, Chairman of the Jamaica Omnibus Services Limited, has retired from the Chairmanship, but remains a Director. He is succeeded by MR. R. J. ELLERY.

NEW EQUIPMENT *and Processes*



SWITCH HEATER

The Arma switch heater was developed in Holland over the last three years and was introduced to the United Kingdom a little over a year ago. Operating on propane gas, the Mills Arma switch heater applies heat by radiation to each of the stock rails by a series of infra-red burners mounted on a pair of burner pipes, and by conduction to the slide chairs.

Ignition is simple; effective heat is attained in 10-15 min., and, as combustion takes place within a ceramic block inside the burner housings, there is no open flame; the burners cannot be blown out and operation is reliable and safe.

No maintenance or adjustment is necessary to ensure continuous and correct operation, except to replace the gas bottles as they become empty; gas consumption is about 1 lb. per switch per hour. All parts of the heater are protected against corrosion.

Light weight

The whole equipment is light in weight, each complete burner pipe with five burners weighing about 20 lb. It is very easily removed and replaced when maintenance work is required on the track, and it is common practice to remove these pipes from the rail altogether during the summer months.

A normal switch requires two burner pipes, one for each stock rail. The length

of the pipes and the number of burners may vary according to the length of switch, but for most lengths (e.g., British Railways B, C, and D switches) pipes about 12 ft. in length are appropriate, each carrying five burners.

At the intake end of each pipe, normally toward the heel of the switch, an Arma patent air mixer is fitted, preset and requiring no adjustment, and protected from obstructions, snow and gusts of wind, by a shield drawing warm air from the first burner.

Each pipe is mounted on two brackets screwed to the sleeper or supported on two of the stock rail bolts, so that it is on a level with the middle of the web of the rail at about 8 in. distance from it.

The pipe is located so that the fifth or last burner is as near as possible to the toe chair and, as spacing of the burners corresponds with the sleeper spacing, each burner applies heat to the rail adjacent to one of the slide chairs. Lateral adjustment can be provided by slots in the pipe mounting brackets and by the screwed connection at each individual burner.

For electrified third-rail systems a special assembly is supplied in which the pipe is fitted at sleeper level and special connections hold the burners in the standard position. Thus, all parts of the assembly are well clear of the live rail.

For switch diamonds usually only two burners are required for each stock rail. Each pair is mounted on a special burner pipe and both pipes are served by a single gas/air mixer. Each pipe is supported by a pair of standard brackets.

The Arma infra-red burner

The Arma patent burner consists of a heavily-enamelled iron casing containing a specially-designed ceramic block protected by wire gauze. For ignition purposes, five holes are provided underneath the casing forward of the burner blocks. The front of the burner housing should be within $\frac{1}{4}$ in. of the web of the rail, and some adjustment of the screw connection may be required to compensate for curvature in the rail. Once ignited, combustion takes place within the ceramic block inside the burner; there is no open flame and heating is entirely by radiation. Effective heat will be obtained 10 to 15 min. after lighting. In service the outside of the burner housing reaches a temperature of about 400 deg. C., the ceramic block inside it about 950 deg. C., and the maximum temperature rise in the rail is about 45 deg. C. (81 deg. F.).

The fuel is propane gas, readily available in bottles of various sizes or in bulk. Where bottles are used they are generally arranged in double pairs connected by an automatic change-over manifold, so that the supply of gas is not interrupted when one pair of bottles becomes empty.

Connected to the manifold is a pressure regulator, set to give a constant output at one atm. (14.7 lb. per sq. in.) from which the gas is conveyed through high-pressure hose to the air mixer on each burner pipe.

The four bottles with manifold are conveniently housed in special cages which can be supplied with the heaters. These both protect the system from casual interference and ensure that the containers remain easily-replaceable in severe weather.

Bulk installations where practicable offer considerable saving in fuel costs.

Ignition

To ignite, the gas supply is turned on and an open flame is held for a few seconds underneath each burner in turn. A very convenient propane gas torch can be supplied for this purpose. Heating cannot be discontinued except by turning off the gas supply.

Further details can be obtained from the Exors. of James Mills Limited, Bredbury Steel Works, Woodley, near Stockport, Cheshire.

MAGNETIC CRACK DETECTION

A new range of magnetic inks and powders for magnetic crack detection includes black/grey high-sensitivity and fluorescent inks. These are supplied in concentrated form in quantities to make 1 gal. This avoids sedimentation during storage and the handling of large containers. To make the inks, the container is gently warmed until the contents melt and these are then poured into a gallon of water; the resultant mixture is then agitated in the usual way.

The advantages of using water as a medium are that it is non-inflammable, has no disagreeable smell, is clean to handle and does not have adverse effects on the skin; additives ensure that the specimens will not rust, that the ink will flow readily over slightly greasy surfaces, and that a proper rate of sedimentation takes place.

The black/grey ink is highly sensitive and contrasts well on bright and black surfaces. The fluorescent ink is less sensitive, but tests show that sensitivity is still good, and the ink gives a clear bright glow

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MR. G. J. MYATT, Principal Costs Assistant (General), London Transport Executive, has been appointed Principal Accounts Assistant in the Chief Financial Officer's Department.

MR. G. F. NOAKES, Principal Stores Assistant, London Transport Executive, who, as recorded in our issue of January 20, has been appointed an officer of the L.T.E. with the title of Stores Superintendent, entered the Stores Department of the London General Omnibus Co. Ltd., in 1922. Before his appointment to Principal Stores Assistant, in June, 1957, he was in charge of the Stores Central Office of the London Transport Executive, and has acted as Deputy to the Supplies Officer.

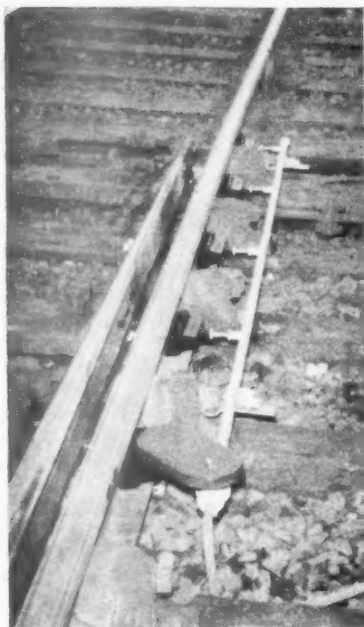
MR. J. WOOD, who has been appointed Principal Catering Assistant, London Transport Executive, joined the L.T.E. in 1949 as a Divisional Catering Controller. In 1957 he was promoted to be Senior Instructor & Inspector of Catering and two years later he became Outdoor Assistant to the Catering Officer. Before he joined the L.T.E. he had many years' experience in the catering trade, and has had wide experience in all aspects of industrial catering. During the war he served in the Royal Air Force with the rank of Flight Lieutenant, and part of this service was spent as Chief Instructor at the R.A.F. School of Cookery.

Road

We regret to record the death of MR. D. HAYS who, until his retirement, in 1949, was Director & General Manager of the Midland General Omnibus Co. Ltd.

MR. W. T. JAMES, Chairman of the Jamaica Omnibus Services Limited, has retired from the Chairmanship, but remains a Director. He is succeeded by MR. R. J. ELLERY.

NEW EQUIPMENT *and Processes*



SWITCH HEATER

The Arma switch heater was developed in Holland over the last three years and was introduced to the United Kingdom a little over a year ago. Operating on propane gas, the Mills Arma switch heater applies heat by radiation to each of the stock rails by a series of infra-red burners mounted on a pair of burner pipes, and by conduction to the slide chairs.

Ignition is simple; effective heat is attained in 10-15 min., and, as combustion takes place within a ceramic block inside the burner housings, there is no open flame: the burners cannot be blown out and operation is reliable and safe.

No maintenance or adjustment is necessary to ensure continuous and correct operation, except to replace the gas bottles as they become empty; gas consumption is about 1 lb. per switch per hour. All parts of the heater are protected against corrosion.

Light weight

The whole equipment is light in weight, each complete burner pipe with five burners weighing about 20 lb. It is very easily removed and replaced when maintenance work is required on the track, and it is common practice to remove these pipes from the rail altogether during the summer months.

A normal switch requires two burner pipes, one for each stock rail. The length

of the pipes and the number of burners may vary according to the length of switch, but for most lengths (e.g., British Railways B, C, and D switches) pipes about 12 ft. in length are appropriate, each carrying five burners.

At the intake end of each pipe, normally toward the heel of the switch, an Arma patent air mixer is fitted, preset and requiring no adjustment, and protected from obstructions, snow and gusts of wind, by a shield drawing warm air from the first burner.

Each pipe is mounted on two brackets screwed to the sleeper or supported on two of the stock rail bolts, so that it is on a level with the middle of the web of the rail at about 8 in. distance from it.

The pipe is located so that the fifth or last burner is as near as possible to the toe chair and, as spacing of the burners corresponds with the sleeper spacing, each burner applies heat to the rail adjacent to one of the slide chairs. Lateral adjustment can be provided by slots in the pipe mounting brackets and by the screwed connection at each individual burner.

For electrified third-rail systems a special assembly is supplied in which the pipe is fitted at sleeper level and special connections hold the burners in the standard position. Thus, all parts of the assembly are well clear of the live rail.

For switch diamonds usually only two burners are required for each stock rail. Each pair is mounted on a special burner pipe and both pipes are served by a single gas/air mixer. Each pipe is supported by a pair of standard brackets.

The Arma infra-red burner

The Arma patent burner consists of a heavily-enamelled iron casing containing a specially-designed ceramic block protected by wire gauze. For ignition purposes, five holes are provided underneath the casing forward of the burner blocks. The front of the burner housing should be within $\frac{1}{4}$ in. of the web of the rail, and some adjustment of the screw connection may be required to compensate for curvature in the rail. Once ignited, combustion takes place within the ceramic block inside the burner; there is no open flame and heating is entirely by radiation. Effective heat will be obtained 10 to 15 min. after lighting. In service the outside of the burner housing reaches a temperature of about 400 deg. C., the ceramic block inside it about 950 deg. C., and the maximum temperature rise in the rail is about 45 deg. C. (81 deg. F.).

The fuel is propane gas, readily available in bottles of various sizes or in bulk. Where bottles are used they are generally arranged in double pairs connected by an automatic change-over manifold, so that the supply of gas is not interrupted when one pair of bottles becomes empty.

Connected to the manifold is a pressure regulator, set to give a constant output at one atm. (14.7 lb. per sq. in.) from which the gas is conveyed through high-pressure hose to the air mixer on each burner pipe.

The four bottles with manifold are conveniently housed in special cages which can be supplied with the heaters. These both protect the system from casual interference and ensure that the containers remain easily-replaceable in severe weather.

Bulk installations where practicable offer considerable saving in fuel costs.

Ignition

To ignite, the gas supply is turned on and an open flame is held for a few seconds underneath each burner in turn. A very convenient propane gas torch can be supplied for this purpose. Heating cannot be discontinued except by turning off the gas supply.

Further details can be obtained from the Exors. of James Mills Limited, Bredbury Steel Works, Woodley, near Stockport, Cheshire.

MAGNETIC CRACK DETECTION

A new range of magnetic inks and powders for magnetic crack detection includes black/grey high-sensitivity and fluorescent inks. These are supplied in concentrated form in quantities to make 1 gal. This avoids sedimentation during storage and the handling of large containers. To make the inks, the container is gently warmed until the contents melt and these are then poured into a gallon of water; the resultant mixture is then agitated in the usual way.

The advantages of using water as a medium are that it is non-inflammable, has no disagreeable smell, is clean to handle and does not have adverse effects on the skin; additives ensure that the specimens will not rust, that the ink will flow readily over slightly greasy surfaces, and that a proper rate of sedimentation takes place.

The black/grey ink is highly sensitive and contrasts well on bright and black surfaces. The fluorescent ink is less sensitive, but tests show that sensitivity is still good, and the ink gives a clear bright glow



under ultra-violet light. Care has been taken to minimise background glow.

Further details can be obtained from the manufacturer, Southern Tools Limited, 22, Upper Mulgrave Road, Cheam, Surrey.

COATED NYLON WAGON SHEET

The railway wagon sheet illustrated has been produced experimentally by Lea Bridge Industries Limited from the coated nylon fabric, Hydex 504. It consists of $5\frac{1}{2}$ -oz. low twist nylon fabric proofed with P.V.C. to give a total weight of $16\frac{1}{2}$ oz. per sq. yd.

The sheet is completely waterproof and, because it never becomes stiff or hard, is easier to handle than the conventional type of wagon sheet. It can be readily folded into a compact bundle, even when wet. It remains relatively light in weight as it does not require the re-dressing necessary with a conventional sheet which increases its weight. Additional advantages claimed for the nylon fabric are its great toughness, durability, and immunity from rotting.

Further details may be obtained from British Nylon Spinners Limited, 68, Knightsbridge, London, S.W.1.

DE-GREASING FLUID

Fleetex de-greasing fluid, which is a grease solvent of the emulsifiable type, is suitable for cleaning workshop floors and for de-greasing machine components. It is claimed to have been successfully tested for track-cleaning purposes on British Railways.

For floors heavily encrusted with grease and dirt, a 50 per cent dilution of Fleetex and water should be applied, brushed in, and allowed to soak for 20 min. Further vigorous brushing should then be carried out to loosen the dirt, which can be removed by hosing or swilling with water.

If the dirt is hard packed to some depth, scraping will assist penetration of the fluid.

Where oil spillage only has occurred, the same procedure should be followed, using a solution in the proportion of one part of Fleetex to three parts of water.

De-greasing of machine parts may be carried out by placing them in a wire basket which is lowered into a tank containing Fleetex, agitated, and left immersed for 10 min.

Further details may be obtained from Isaac Bentley & Co. Ltd., Vinoleo Oil Works, Trafford Park, Manchester, 17.

RAIL JOINT BOLTING MACHINE

The R.M.C. Boltmaster is a track-maintenance machine designed to tighten or remove all bolts at a rail joint in a single operation. It is equipped with six

hydraulic torque wrenches mounted on a head, which can be traversed from one rail to the other. The machine can be adapted for use with four-bolt joints.

All operations are under the control of one man, and it is claimed that as many as three joints a minute can be dealt with.

The framework of the machine is of fabricated construction. It is self-propelled with hydraulic drive, and exact positioning of the wrench head is effected by a hydraulic actuating cylinder. The six wrenches are adjustable for all bolt centres, and engage the bolts from both sides of the rail.

Bolt tension is controlled by regulation of hydraulic pressure, and sufficient torque can be applied to remove seized nuts or to twist off bolts if necessary. The wrench sockets are fitted with springs to eject the nuts when the wrenches are unclamped.

Further details may be obtained from Railway Maintenance Corporation, Box 1,888, Pittsburgh 30, Pa., U.S.A.

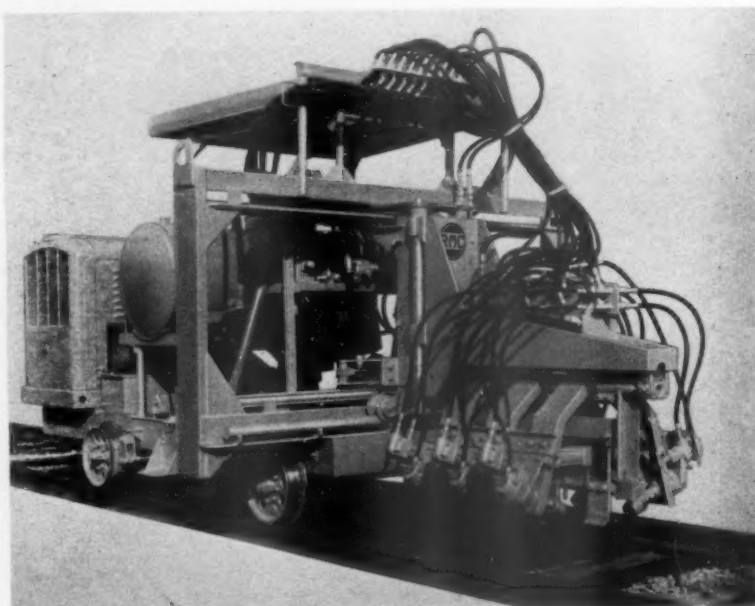
PROPANE HEATING TECHNIQUE

Pre-heating and drying of 60- to 80-ton pouring ladles at Bynea Steelworks Limited, Loughor, Carmarthenshire, has been simplified and speeded up by a heating device using propane.

A portable air - induced propane burner is put in the ladle to get rid of moisture after re-bricking and to prevent the molten steel chilling.

The process takes about 2 hr. Offering speed and economy, it also does away with ladle cleansing and needs little or no supervision.

Further details can be obtained from the British Oxygen Co. Ltd., Bridgewater House, St. James's, London, S.W.1.



Ministerial view of transport

Mr. John Hay, Joint Parliamentary Secretary, Ministry of Transport, discusses relative merits of integration and co-ordination

Speaking at the Coal Industry Society Luncheon at the Hyde Park Hotel, London, on February 6, Mr. John Hay, Joint Parliamentary Secretary to the Ministry of Transport, referred to the present divergence of views between advocates respectively of integration and co-ordination of transport.

Supporters of integration thought that duplication of transport facilities was wasteful, and disliked seeing heavy road traffic while the railways were not carrying to full capacity.

They also disliked competitive air services which operated at rates equal to, or less than, those of the railways, and regarded the "uncontrolled competition" of the C-licensed vehicle as an abuse of individual liberty. They held in low regard Ministers who countenanced the provision of public money for motorways and, simultaneously, for railway modernisation.

Master plan and tailored investment

They thought a master plan should be devised to eliminate duplication, avoid "wasteful competition," and ensure that traffic travelled by the system best fitted for the job. Public investment should be tailored to fit; the Government should decide where modernisation should occur and investment capital should be controlled accordingly.

Mr. Hay said that this policy would not work as efficiently as did the present system. Who would decide whether competition was wasteful? Or whether individuals would travel by one form of transport rather than by another?

Surely the trader knew best whether to use his own lorries rather than rail or road haulage?

Should a manufacturer with a deadline be denied the use of the quickest form of transport, just because someone had decided another method was cheaper in normal circumstances and therefore more efficient? Where urgency was not important, was a consignor of coal to be prohibited from using a slower form of transport simply because it had been decreed that coal should go by rail?

Difficult decisions

These cases required difficult decisions, or the plan would have to include so many qualifications and clauses as to make it unworkable.

Integration of transport had never been successful in any country outside the Iron Curtain. Transport had to be provided for many different situations and to individual requirement. Much of the economic strength of our highly-diversified society

was drawn from the constant interaction and interdependence of different activities. Freedom of choice by the consumer was a basic requirement; economic efficiency must be the lodestar, and flexibility the watchword.

Co-ordination of transport—a very different thing—implied that each form of transport could attract the traffic most suited to it. The Government should foster development of all forms of transport in the most effective way best suited to the interests of the user.

It meant all possible help for the *ad hoc* and day-to-day arrangements whereby services provided by one medium interlocked with those of another. It meant the efficient and flexible correlation of all forms of transport—not the welding together of them in a vast and rigid framework which must sooner or later break under its own weight.

Co-ordination a logical development

In practice, co-ordination of transport, as set out in the recent White Paper, represented a logical development of basic Government policy, taking account of current circumstances.

The White Paper had emphasised that the railways were a vital basic industry and that a railway system of the right size was an essential element in our transport network, and would remain so for as long as could be foreseen. Much thought would have to be devoted by the new Railways Board to the question of the "right size" of the railway system.

This would depend on two factors. The first was the ability of a given line or service to attract the volume of traffic necessary for it to contribute adequately to the viability of the system as a whole. The second was the extent to which modernisation could play a part in providing that attraction for traffic in the face of competition.

Heavy investment approved

It had been wrongly suggested that the Government lacked faith in modernisation. At £140 million, the railways investment allocated for 1961, though lower than that for 1960, was still a vast sum. The Government had merely recognised the serious financial plight of the railways and the changes that had occurred since modernisation had first been planned in 1955.

Modernisation had not been substantially slowed down. At a total of over £140 million, 70 major schemes had been begun and allowed to continue. Other projects to a value of over £20 million had been approved, together with rolling-stock programmes amounting to over £30 million.

The London Midland electrification scheme had been approved. In considering this and other schemes, the needs of industry had been borne in mind. The Government had faith in the country's electrical industry and was also indirectly helping the coal industry.

Many of the Government's proposals for the railways were intended to help them act as a commercial enterprise. It would be wrong to leave them subject to out-of-date restrictions on their commercial activities.

The railways were to be freed from restrictions on fares and charges (except London fares); those on property development would be relaxed; powers would be granted to operate pipelines, and provisions protecting coastal shipping from inland transport competition were being looked at again.

It was important to get the right people to run the railways and encourage employees to rise to the top. The new management structure was designed for greater efficiency.

Industrial film festival at Turin

The Federation of British Industries has announced that the second International Film Festival to be held under the patronage of the Council of European Industrial Federations (C.E.I.F.) will be held at Turin from June 25-28, 1961.

The F.B.I. and the British Employers' Confederation have been invited by the Festival organisers to submit by March 30 a selection of up to 15 British industrial films.

Firms and associations wishing to submit entries for selection by a panel appointed by the F.B.I. and B.E.C. should write to Mr. F. L. Stevens, Federation of British Industries, 21, Tothill Street, London, S.W.1, for a copy of the entry form and festival regulations.

London-Paris road/air/rail service

The "Silver Arrow" London-Paris service of the French National Railways and Silver City Airways Limited will operate from June 23 to September 18.

The route is via Ferryfield Airport (Lydd) and Le Touquet. Travel is by Budd diesel railcar between Paris Nord and Etaples, and light refreshments will be on sale in the cars; the schedules for the 141-mile rail journey will be 141 min. northbound and 148 min. southbound. The air crossing takes 20 min. Passengers are conveyed by motor-coach between Etaples Station and Le Touquet Airport, and between Ferryhill and Victoria Coach Station, London.

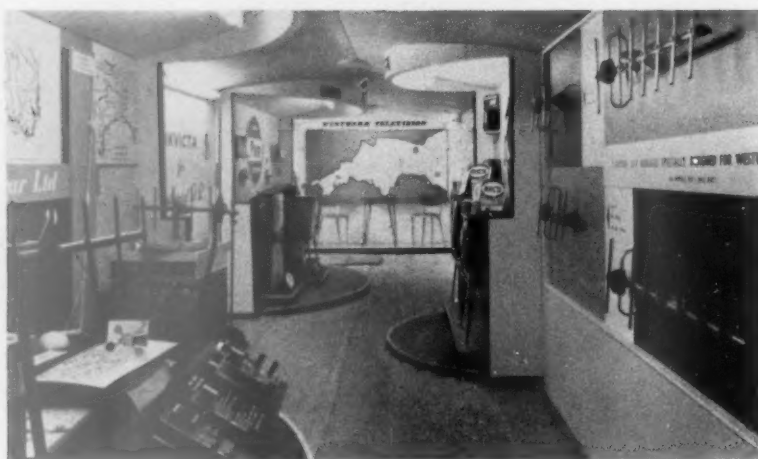
Southbound departure from London will be at 8.30 a.m., with arrival at Paris Nord at 2.55 p.m.; northbound passengers leave Paris at 9.42 a.m. and will be due Victoria Coach Station at 3.55 p.m.

The adult fares are £4 15s. single and £8 15s. return.

More B.R. steam locomotives to be preserved

The world's fastest steam locomotive, the Pacific, *Mallard*, designed by Sir Nigel Gresley, which, on July 3, 1938, on the L.N.E.R. East Coast main line near Peterborough achieved 125 m.p.h., is one of the 27 steam engines scheduled by the B.T.C. for preservation as historical relics.

Others are: 4-6-2 *Duke of Gloucester*, designed by Mr. R. A. Riddles and his staff, and the last big express passenger engine built for British Railways; G.W.R. 4-6-0s *Caerphilly Castle* (1923) and *King George V* (1927); one each of the Southern Railway *King Arthur* and *Lord Nelson* class 4-6-0s; the L.M.S.R. 4-6-2 *City of Birmingham*



Interior of one of the coaches of the television exhibition train

(1937); the first of the British Railways standard locomotives, Class "7" 4-6-2 No. 70000, *Britannia*; and Class "9" 2-10-0 goods engine *Evening Star*, the last steam locomotive built for British Railways.

The existing collection of 44 engines ranges from an early Hetton Colliery locomotive of 1822 to one built in 1920. Among them are the Stockton & Darlington *Locomotion* (1825); the G.W.R. *North Star* (1837), and the G.N.R. Stirling single No. 1 (1870).

Preservation by railway companies

Preservation was begun by the former railway companies and the collection was continued by the Commission after nationalisation in 1948, when it numbered 26 engines. Since then 14 more have been preserved after service and four have been donated.

In 1958, after a meeting between Sir Brian Robertson, Chairman of the B.T.C. and

representatives of the principal railway and historical societies, a consultative panel was formed to help the B.T.C. Curator of Historical Relics, Mr. J. H. Scholes, in selecting locomotives and other equipment for preservation.

Of the additional 27 locomotives 19 were proposed by the panel and eight by the Commission. They will be added to the existing 44 as they are withdrawn from service; it will be many years before the last is available. The complete collection will trace the history of the British steam locomotive from its origins to its replacement by electric or diesel power.

It is hoped that some engines will be shown in museums, and that places will be found for the rest well before the last is available for exhibition. The *Caerphilly Castle* is to go to the Science Museum, South Kensington, and the *City of Birmingham* to the Museum of Science & Industry, Birmingham.

Television train on exhibition

By chartering a train from the Western Region of British Railways for a 1,200-mile tour, Westward Television has devised a new method of reaching prospective viewers in South West England to popularise the television studios it will open in Plymouth next April.

The train, comprising three coaches filled with exhibition stands, a studio coach, a reception coach incorporating a cinema with 45 seats, and a van containing the generator, was "launched," by the Rt. Hon. Sir Bernard Waley-Cohen, the Lord Mayor of London, on February 9 in Kensington Olympia Station. The ceremony was attended by some 200 guests.

The tour itinerary embraces 16 Western Region stations and seven Southern Region stations, from February 13 to 20. The "City of Truro" locomotive will haul the train on the Western Region portion of the tour.

During the six-week journey the train will be on show in the West Country, British Railways is arranging a programme of cheap fare facilities to each venue from districts surrounding the 23 chosen towns.

A short opening ceremony will be performed by the senior civic dignitary of each town. This will take place at 2 p.m. on the first day.

The coaches were stripped of their interiors at the Old Oak Common Depot of the Western Region and fitting-out was undertaken by Trades Exhibition Limited.

B.T.C. at the Electrical Engineers Exhibition

The British Transport Commission signals & communications feature at this year's Electrical Engineers Exhibition (Earls Court, March 21-25) will include recent developments in the electrical engineering aspects of railway modernisation; put over by means of models and actual equipment. A work-



The television exhibition train at Kensington Olympia Station, Western Region, British Railways

ing model, designed for the exhibition, will demonstrate the effectiveness of the latest overhead equipment. This will include actual signal-cabin controls installed to operate signalling and track-side electrical equipment; a cabin being built alongside a station platform complete with standard track. The platform will be used to demonstrate the latest types of station illumination, lighting standards and signs. The railways exhibit will not only be a display of present work, but emphasis will also be given to research programmes on signalling relays, recorders for movement information, controlling equipment for electrical power supply, and many other features concerning communications.

Freight wagons for Western Australian Railways

With its current rolling stock programme nearing completion, the Western Australian Government Railways has announced plans for the construction of more than 100 new goods wagons in Midland Junction Workshops during the current financial year. The first work to be undertaken will be for a repeat order for 10 of the 70-ft. "QMB" double-deck motor body wagons. This will double the fleet of these wagons which have proved highly successful in speeding up motor body transits and reducing tare haulage for this traffic. The number of motor bodies railed from the Eastern States to assembly works near Perth has recently increased considerably and the new wagons will be placed on the movement of this traffic between Kalgoorlie and the metropolitan area. Each wagon makes the round trip six times monthly, carrying up to 12 bodies a trip.

Cool-storage vans

The second type will comprise 15 four-wheel cool-storage vans classed "EB." These will be of a new type based on the design of the "WA" all-steel bogie cool-storage vans introduced in 1958. The layout will conform as near as possible to the bogie type for simpler construction with consequent ease of maintenance. These vehicles will be used mainly to handle increasing meat, butter and other perishable traffic in South Western and Southern districts. It is perhaps significant of modern trends that of 125 new wagons to be built at Midland Shops, these are the only four-wheelers.

Following experience gained with the

"RC" and "RCA" medium and highside bogie open wagons, 50 of a similar type, Class "RCB," are to be constructed. These will incorporate features not previously seen on W.A. bogies, i.e., 6-ft. high sides with 4-ft. 6-in. side doors over the full height of the wagon, and end discharge doors for bulk consignments. In other respects this type will conform with previous types with a 36-ft. standard underframe and tare weight of approximately 14½ tons allowing a payload on heavy rail track of approximately 39½ tons. The wagons are designed for and will be used mainly in bulk wheat traffic.

Conversion of bogie vans

High-speed transits of perishable and other goods will be facilitated by the construction of 50 semi-louved bogie vans classed "VF." These will be an improvement on the fully-louved "VD" vans which have carried the bulk of this traffic since their introduction in 1953. The two single sliding doors on the older type will be replaced by a 9-ft. double door which will allow easier handling especially of larger consignments for which covered transit is essential. The vehicles will be used extensively on passenger services and on fast goods trains running at passenger speed, particularly the "West-freight" goods express which carries inter-State tranships overnight from Kalgoorlie to the Perth metropolitan area. Standard 36-ft. underframes will again be used and the vans will have a load capacity of up to 39½ tons. Van dimensions (inside) will be length 35 ft. 10½ in., width 7 ft. 6½ in., height at centre 8 ft. 4 in.

Improved tourist facilities in the North East

High praise for the "stimulating and encouraging" outlook and attitude shown by the North Eastern Region of British Railways came from Mr. A. R. Colmar, Secretary of the Association of British Travel Agents in Leeds when he and ticket agents met railway officers in Leeds and Newcastle recently.

The meetings were chaired by Mr. W. H. Vine, Commercial Officer of the North Eastern Region, who referred to a proposal under consideration whereby literature advertising ticket agents' tours by rail would be available at railway stations.

Mr. S. W. Jesper, Public Relations & Publicity Officer, suggested the installation in Inquiry Offices of display units with

apparatus to accommodate descriptive pamphlets. These units could be used to advertise inclusive tours. This suggestion was welcomed by the agents.

Mr. Vine reported that, in comparison with 1959, there had been an increase of 4.8 per cent in revenue earned by agents in the Region as a whole. In the Leeds area, the increase had been 12.09 per cent and, in the Newcastle-Middlesbrough area, it had been 7.26 per cent.

Mr. A. H. Moncrieffe, Assistant Commercial Officer (Passenger), announced an experimental scheme under which concessionary fares would be granted to certain ticket agents in connection with inclusive tours by rail. Mr. Vine announced a new "Freedom of Scotland" ticket at a charge of £10. The ticket would be valid for 14 days. He also said that two new-type sleeping coaches would be provided in the "West Country" and "Continental" trains this year, while the number of modern vehicles on the "Highland" service would be increased to three. A ticket would be introduced to cover the York-Bridlington-Scarborough-Whitby run, with the addition of the York-Harrogate branch. This branch would be open for passenger traffic on Sundays during the forthcoming summer.

Record Westinghouse signal installations

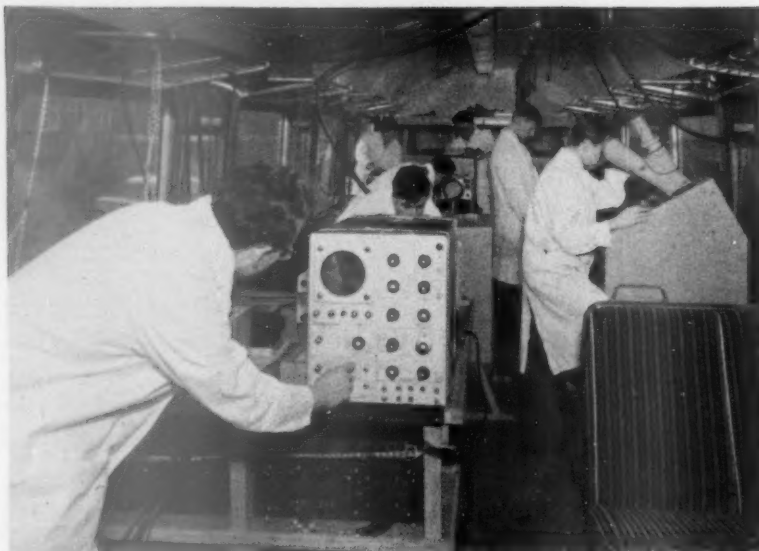
A record in installation of signal equipment was achieved in the year ended October 1, 1960, by the Westinghouse Brake and Signal Co. Ltd., and good progress has been made in modernisation of British Railways signalling. The Chairman, Mr. A. R. Nutting, states in his review of the year that this reflects the record production of the preceding 12 months. He expects output to continue on the low side during the current year, because of "the lack of firm decision on the part of the Government as indicated by the number of Government committees which have been reviewing the British Railways modernisation plan." Even if conversion to diesel traction is substituted for electrification, he points out, modernisation of signalling will still be needed. The output of the company's Chippenham Works was a record.

Subsidiary companies

Among subsidiary companies Gresham & Craven Limited experienced a reduced home and overseas demand for vacuum



North Eastern publicity—(left): unit for window display; (right): Mr. W. H. Vine and Mr. A. R. Colmar inspecting new publicity material (paragraph on this page refers)



G.E.C. mobile laboratory in coach of three-car train unit in the Eastern Region

brakes. The results of W. R. Sykes Interlocking Signal Co. Ltd. were disappointing because of expenses in developing new products and lack of orders. Westinghouse Garrard Ticket Machines Limited was actively concerned in mechanisation of British Railways ticket offices, and further large installations are scheduled. Export orders had increased. Two types of portable ticket machines have been developed.

Saxby & Farmer (India) Private Limited results were slightly below, due to raw material supply difficulties and to a reduction in vacuum brake work, but Mr. Nutting believes the potential Indian demand for electrical signalling and air and vacuum brake equipment to be very great.

The general demand for the group's railway brake and signalling is expected to continue high, and the rectifier business is expanding. Group profits at £1,106,665 are slightly below the previous year's. A dividend of 11 per cent is recommended.

G.E.C. test train in the Eastern Region

As a result of consultation between the British Transport Commission and the General Electric Co. Ltd., the company has fitted out a three-car unit No. 408, as a mobile laboratory. It will establish the working conditions of the high-voltage electrification on the North East London lines of the Eastern Region. The train has just started running between Enfield Town and Chingford via Hackney Downs.

Although the trains for the Eastern Region new suburban electrification system ran for many thousands of miles perfectly satisfactorily when on test on 25 kV., certain troubles were encountered when these trains entered service, which included a substantial amount of running on 6.25 kV.

These failures are now being investigated by Brigadier C. A. Langley, Chief Inspecting Officer of Railways, Ministry of Transport, and he is being assisted by Mr. E. L. E.

Wheatcroft, a partner of Messrs. Merz & McLellan, and a member of the British Transport Commission panel of consulting engineers.

Unit 408 is running coupled to another three-car unit so that its tests will be representative of normal six-car train working. Testing is being carried out by night as well as by day.

Stripped of seats, the saloon of 408's motor coach (the central coach) has been fitted with instruments to measure and record voltages and currents at every stage of the train's traction system: from the pantograph which takes current from the overhead line, through switching devices, the transformer, rectifiers, and chokes to the motors.

Cathode-ray oscilloscopes will show the G.E.C.'s 11-man test team, headed by Mr. D. L. Rawle, Test Co-ordinator, what is happening in the circuits under actual running conditions. Some of these oscilloscopes can give a picture of electrical changes occurring in millionths of a second. In addition, there is an ultra-violet direct recorder which can take measurements at 12 points at a time and, with its ultra-violet lamp burning traces in paper, record continuously all 12 readings to give a composite picture.

Staff & Labour Matters

Railwaymen's wage claim

A.S.L.E.F. has decided to support the move initiated by the N.U.R. for the presentation of a new wage claim to the British Transport Commission for substantial pay rises for railway salaried and conciliation staff on the grounds of comparability with rates and pay in outside industry.

The question of lodging a joint claim will be discussed further by representatives of the three railway trade unions today, February 17, the date for consideration by the Railway Staff National Council of the unions' claim for the introduction of a shorter working week for railway staff.

Questions in Parliament

Curtailement of rail facilities

Mr. B. Janner (Leicester N.W.—Lab.) asked the Minister of Transport on February 8 whether he was aware that there was growing concern about the cutting-down of facilities for rail travel to and from the Leicester area, and whether he would refer the curtailment of such facilities and the need to provide alternative means of transport to the appropriate Transport Users' Consultative Committee.

Mr. Ernest Marples, in a written answer, said that users could always make representations to the appropriate Transport Users' Consultative Committees. The British Transport Commission referred all proposed closures to those committees.

Mr. Francis Noel-Baker (Swindon—Lab.) asked the Chancellor of the Exchequer on February 9 whether he had yet decided when he would publish a White Paper on public investment in private industry.

Sir Edward Boyle, Financial Secretary to the Treasury, in a written answer, stated this was to be done. Information would be published in the Financial Secretary's Memorandum on the 1961-62 estimates for the Civil and Revenue Departments, which would appear on Budget Day.

Railway assets

Mr. J. W. Peyton (Yeovil—C.) asked the Minister of Transport on February 8 what was the estimated replacement value of the railway assets represented by the £800 millions proposed to be placed to suspense account.

Mr. Marples, in a written answer, stated that no estimate existed and it would be impracticable to make one.

Investment in nationalised industries

Mr. Basil de Ferranti (Morecambe & Lonsdale—C.) asked the Chancellor of the Exchequer what had been the average value of investment per man employed during each of the last 10 years by nationalised industries and private industry respectively; and to what extent production, per man, had increased over the same period in each of these two sectors of the economy.

Mr. Anthony Barber, Economic Secretary to the Treasury, in a written answer, gave figures of average investment per person employed, at constant 1954 prices. It was not possible, with available data, to give corresponding figures of production per man.

Egyptian Delta Light Railways

Mr. Martin Lindsay (Solihull—C.) asked the Lord Privy Seal on February 8 what further representations had been made to the United Arab Republic about compensation for United Kingdom stockholders in the Egyptian Delta Light Railways, and with what results.

Mr. Edward Heath said he understood that this case, which first arose out of the transfer of the control and management of the company concerned to Egypt in 1945, had been taken up in the Egyptian courts on behalf of certain debenture holders and still formed the subject of legal proceedings. It would not be appropriate for H.M. Government to make representations in the matter to the Government of the United Arab Republic.

CONTRACTS AND TENDERS

South African Railways contracts for railway traffic tarpaulins

The South African Railways has placed contracts for the reproofing and stencilling of new and used railway traffic tarpaulins for the period January 1, 1961, to December 31, 1961, with Williams Dyers Limited, to the value of £67,348 and with G. C. Shave Limited, to the value of £211,152.

British Railways, London Midland Region, has placed the following contracts:—

Scaffolding (Great Britain) Limited: design, supply and erection of gantry at Old Road Station, Finchley

Ashwell & Nesbit Limited: installation of steam heating in the Steel Foundry, Locomotive Works, Crewe

Limmer & Trinidad Lake Asphalt Co. Ltd.: floor surfacing at Ducie Street and Deansgate Warehouses, Manchester

Worthington (Contractors) Limited: club building for Staff Association at Walton-on-the-Hill

W. Walkerdine Limited: alteration to Staff Association building at Willesden

The Butterley Co. Ltd.: fabrication and delivery of composite deck units for partial re-construction of bridges Nos. 5 and 5A on the Grand Junction line at Bank Quay Station, Warrington

J. Booth & Sons (Bolton) Ltd.: supply, fabrication and delivery of steelwork for superstructure of bridge No. 98 on Liverpool-Manchester line.

British Railways, Scottish Region, has placed the following contracts:—

G. N. Haden & Sons Ltd.: heating installation for building work at Inverness

Westinghouse Brake & Signal Co. Ltd.: train describer equipment, for resignalling scheme, Perth.

British Railways, North Eastern Region, has placed the following contracts:—

K. S. Construction Co. Ltd.: installation of electric lighting and power supply in the staff amenity block at the modernised Gateshead Motive Power Depot

Wm. T. Wallace & Son Ltd.: reconstruction of the roadway at Walkergate Carriage & Wagon Works

F. & J. Watkinson: demolition of buildings and supply of new pavings at the modernised Bradford Hammerton Street Diesel Depot

Holman Bros. Ltd.: provision of tractor-mounted air compressors, for the Chief Civil Engineer

Sorrell Limited: provision of reinforced concrete foundations for wagon retarders at the Dringhouses Marshalling Yard, York

British Insulated Callender's Cables Limited: supply and erection of a comprehensive lighting installation at the new marshalling yards, Newport, near Middlesbrough

Berwick Building Company: construction of a compressor house at Newcastle Central Station

John Shaw & Sons (Salford) Ltd.: supply of a 350-ton hydraulic press for use at Shildon Wagon Works

John Boyd & Co. (Engineers) Ltd.: provision and erection of a 7-ton electric overhead travelling crane at Holbeck Motive Power Depot, Leeds

James Scott & Co. Ltd.: installation of electric power supply, including heating and lighting for the Carriage & Wagon Development Unit at Stoopdale, Darlington

Brims & Co. Ltd.: piling work to the east abutment and wing wall of the bridge near the up yard hump at the new marshalling yard, Newport.

F. & J. Watkinson: construction of a new enquiry office and staff amenities at Bradford Exchange Station.

BOARD OF TRADE

The Export Services Branch, Board of Trade, has received calls for tenders as follow:—

From Pakistan:

2,300 single vacuum gauge (C. & W.), complete, with adaptor

120 van valves (C. & W.)

500 18-in. cylinders, combined, "E" type (C. & W.), complete with pistod rod, stainless steel without release valves

120 21-in. cylinders "F" type, for loco and (C. & W.)

32 12-in. vacuum cylinders "D" type

1,100 1-in. release valves, single branch, for combined "E" type cylinder.

The issuing authority is the Chief Controller of Stores, North Western Railway, Lahore, to whom bids should be sent. The tender No. is 210-S/14-A(Part III)PIC-61.

The closing date is March 1, 1961. The Board of Trade reference is ESB/3827/61.

From Egypt:

111,000 Kgs. of mild steel flats.

The issuing authority is the Purchases & Stores Department, Railways Building, Shoubra Subway, Cairo, to whom bids should be sent. The tender No. is E.R.301.G.8/841.

The closing date is March 8, 1961. The Board of Trade reference is ESB/3779/61. No further information is available at the Board of Trade.

30,000m. paper-lined, lead-coated, mild steel conduits and other electric materials.

The issuing authority is the Purchases & Stores Department, Railways Building, Shoubra Subway, Cairo, to whom bids should be sent. The tender No. is E.R.331.G.8/534.

The closing date is February 22, 1961. The Board of Trade reference is ESB/3778/61. No further information is available at the Board of Trade.

From Iraq:

Construction of bridges and culverts between Diwaniyah and Samawa.

The issuing authority is the Directorate-

General, Iraqi Republican Railways, to whom bids should be sent. The tender No. is 11. The closing date is March 23, 1961. The Board of Trade reference is ESB/3748/61. No further information is available at the Board of Trade.

From Greece:

Steel for making locomotive piston rods.

The issuing authority is the Purchasing & Stores Department, Hellenic State Railways, 34 Themistocleous Street, Athens, to whom bids should be sent. Local representation is essential. The tender No. is 4947. The closing date is February 24, 1961. The Board of Trade reference is ESB/3788/61.

From Turkey:

Supply of steel tyres for locomotives, tenders, and wagons.

The issuing authority is the Turkish State Railways. Full specifications and conditions can be obtained from T. C. Devlet Demiryolari Isletmesi, Merkez Alim ve Satim, Komisyonu Reisligi, Ankara. The closing date is February 27, 1961. The Board of Trade reference is ESB/4300/61. No further information is available at the Board of Trade.

From Portuguese East Africa:

Several items of electrical equipment.

The issuing authority is the Ports, Railways & Transport Department, Lourenco Marques, to whom bids should be sent. The tender No. is 46/61. The closing date is March 17, 1961. Specifications are obtainable from the Railway Warehouse at Lourenco Marques through the local agents of United Kingdom firms interested. The Board of Trade reference is ESB/4593/61. No further information is available at the Board of Trade.

Permanent way material including rails, fishplates, rail bolts, screwspikes and points.

The issuing authority is the Ports, Railways & Transport Department, Lourenco Marques, to whom bids should be sent. The tender No. is 2/AB/CFM/61. Specifications and drawings are obtainable from the Railway Warehouse at Lourenco Marques through the local agents of United Kingdom firms interested. The closing date is April 18, 1961. The Board of Trade reference is ESB/4588/61.

Various tools.

The issuing authority is the Ports, Railways & Transport Department, Lourenco Marques, to whom bids should be sent. The tender No. is 45/61. Specifications are obtainable from the Railway Warehouse at Lourenco Marques through the local agents of United Kingdom firms interested. The closing date is February 28, 1961. The Board of Trade reference is ESB/4592/61. No further information is available at the Board of Trade.

Further details relating to the above tenders together with photo-copies of tender documents, unless otherwise stated, can be obtained from the Branch (Laccon House, Theobald's Road, W.C.1).

NOTES AND NEWS

Electronic accounting in the Eastern Region.

As part of a scheme to improve methods of stores accounting, stores control and payroll compilation, the Eastern Region of British Railways is installing electronic equipment at Stratford and Doncaster, the two main workshop centres in the Region. The machines are located in the Works Accountant's Offices and the production of information by the new equipment is being introduced by stages.

The Institution of Locomotive Engineers.

The Golden Jubilee Luncheon of the Institution of Locomotive Engineers will be held at the Dorchester Hotel, London, W.1, on Wednesday, May 10. Mr. D. C. Brown, President of the Institution will be in the chair.

Railway modernisation in the Sheffield area.

The Eastern Region of British Railways has announced that approval has now been given to big new railway modernisation works to be undertaken in the Sheffield area. A freight marshalling yard and diesel depot are to be constructed at Tinsley and a new freight depot is to be built at Grimesthorpe. The expenditure of about £9 million—£7 million for the marshalling yard and diesel depot—£2 million for the freight depot—will produce estimated savings of at least £1 million a year and greatly improve efficiency.

Ferodo factory in North Wales.

Ferodo Limited has appointed Taylor Woodrow Construction Limited as the main contractors for its new factory on a 50-acre site at Griffiths Crossing, near Caernarvon, and work has begun. The cost of the whole project is expected to be £2,500,000; it is expected that a further £1,000,000 will be spent on additional equipment and plant re-arrangement at the Ferodo works at Chapel-en-le-Frith, Derbyshire. The estimated date of completion of construction is April, 1962. The new factory will manufacture all types of Ferodo "woven" brake linings and clutch facings. The move of some departments from Chapel-en-le-Frith

will make space available there for expansion of production of moulded linings for drum brakes, friction pads for disc brakes, moulded clutch facings, and sintered metal materials.

Institution of Locomotive Engineers meeting.

A general meeting of the Institution of Locomotive Engineers will be held on March 21, 1961, at 5.30 p.m., in the Lecture Hall of the Institution of Mechanical Engineers, 1, Birdcage Walk, London, S.W.1. A paper on "Cooling equipment on diesel locomotives," by Mr. T. Rudge and Mr. M. Forbes will be presented and discussed.

Transport Equipment (Thornycroft) purchase by A.C.V.

The design, research and production activities of Associated Commercial Vehicles Limited and of Transport Equipment (Thornycroft) Limited are to be integrated, in view of the purchase of the latter firm by A.C.V. Limited, but the name of Thornycroft as road transport vehicle constructors is to continue. This was stated by Lord Brabazon of Tara, Chairman of A.C.V. Limited, at the recent annual meeting.

Dunlop Rubber Co. Ltd. Chemical Products Division sales re-organisation.

The sales force of Dunlop Rubber Co. Ltd., Chemical Products Division, has been divided into two sections to handle increased business, one dealing with adhesives and compounds, the other with polymers. A new position, Manager, Automotive Sales, has been created. The new system replaces sales control by areas, although supply depots, in Glasgow, Salford, and Wembley, are retained. Mr. H. J. Northeast becomes General Sales Manager, Mr. F. G. Delahoy becomes Sales Manager, Adhesives & Compounds; Mr. J. D. Banks becomes Sales Manager, Polymers, and Mr. P. H. S. Burge has been appointed Manager, Automotive Sales.

Institution of Railway Signal Engineers.

The accompanying illustration shows the Council of the Institution of Railway Signal

Engineers at a recent meeting. The members are, seated, left to right, Messrs. J. S. S. Davis; J. C. Kubale; E. G. Brentnall; R. L. Weedon, Hon. General Secretary; W. Owen, President; D. E. Caird, of C. F. Burton & Co. Ltd.; Treasurers, D. G. Shipp, J. F. H. Tyler, A. F. Wigram. Standing, left to right, L. J. M. Knotts, R. Dell, O. H. Hoffman, B. H. Grose, N. S. Hurford, A. A. Cardani, F. G. Hathaway, J. P. Coley, E. A. Rogers, M. Le Sueur, R. A. Green, A. E. Williams, A. E. Walker, H. W. Hadaway, B. Reynolds, A. W. Woodbridge.

Sliding wagon roof.

A prototype wagon fitted with MacGregor opening roof was demonstrated at Paddington Station, British Railways, Western Region, last Wednesday. This opening roof, developed by MacGregor-Comarain S.A., Paris, and manufactured in the United Kingdom by Rubery Owen & Co. Ltd., is being extensively used in the French National Railways. The sliding roof was described in our issue of November 6, 1959. The roof forms an integral part of the wagon.

Ground space for travel.

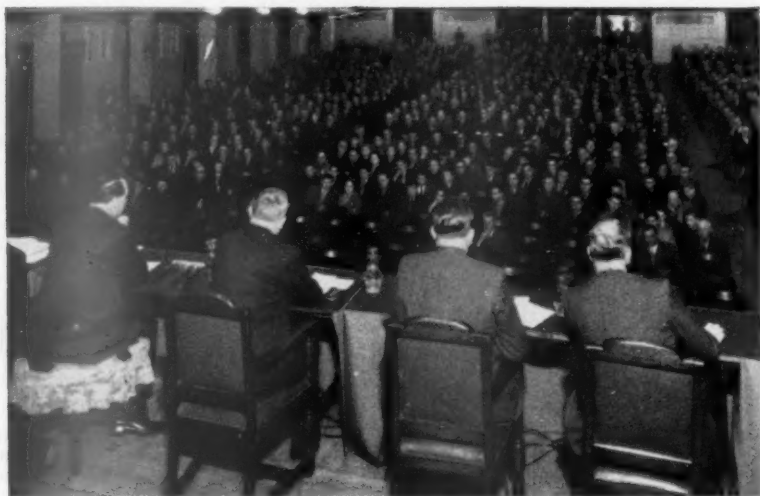
Travel by rail at peak hours requires less ground space than any other form of surface transport, including walking, according to an investigation by the Road Research Laboratory of the Department of Scientific & Industrial Research. Dr. R. J. Smeed, the Laboratory's Deputy Director for Traffic & Safety, last week outlined the results of the investigation to a meeting of the Manchester Statistical Society. It was found that at peak times a journey by one person of one mile required about 1 sq. ft. by suburban railway, 3 sq. ft. by walking, between 5 and 80 sq. ft. by car (according to the number of passengers and type and width of road) and between 4 and 10 sq. ft. by bus.

Collision with derailed wagon.

The 10.23 p.m. up passenger train from York to Swindon was derailed early on February 11 when it ran into a derailed wagon fouling the up line near Rugby Central, London Midland Region. The driver was killed and two railwaymen injured; no passenger was hurt. The wagon was in the 1.50 a.m. down Woodford to Sheffield goods train. Both the blocked tracks were cleared by the



Council of the Institution of Railway Signal Engineers



North Eastern Region open forum at Newcastle

morning of February 13. An emergency bus service operated between Rugby Central and Lutterworth.

Open forum at Newcastle. The North Eastern Region of British Railways held an open forum in the City Hall at Newcastle on February 8. The above illustration shows part of the audience, estimated at over 1,000, which attended one of the liveliest sessions yet. The next meeting will be in Halifax on February 28.

Decimal currency system in South Africa. The Union of South Africa has adopted the decimal currency system with the Rand as the unit of currency instead of the £ and the cent instead of the penny. The Rand is the equivalent of 10s. and is the smallest denomination in notes. Coins are 50 cents (5s.), 20 cents (florin), 10 cents (shilling), 5 cents (sixpence), 2½ cents (threepence), 1 cent, and ½ cent. The notes are R1 (10s.), R2 (£1), R10 (£5) and R20 (£10).

Diesel failure on Tonbridge line. Trains from Charing Cross and Cannon Street to destinations in Kent and Sussex via Tonbridge, Southern Region, British Railways, were delayed on February 8 when the diesel locomotive hauling the 4.36 p.m. train from Cannon Street to Folkestone failed near Chelsfield. The line is electrified to Sevenoaks, whither the train was propelled by a following electric train. Arrangements were made for transfer of passengers to the 4.56 p.m. express from Cannon Street, stopped specially at Sevenoaks, and other trains were diverted.

London Transport Players. On February 1-4 the London Transport Players presented "Carousel" at the Scala Theatre, London, W.1, the music of which is by Richard Rodgers and lyrics by Oscar Hammerstein II. This delightful American musical was most ably conducted by John Pinches, the musical director, and was well within the scope of this talented society. Excellent performances were given by Heather Holford as Carrie Pipperidge, Joan Partington as Julie Jordan and Glyn Martin as Billy Bigelow. The standard of singing of these artists was high, as indeed was that of every member of

the large cast. The chorus and dancers were well trained and acquitted themselves worthily. The entire production was staged and devised by Eva Callebaut and the ballet master was Andre Cordova.

More demand for Leyland diesels. An increase in the demand for diesel engines during the year ended September 30, 1960, is reported by Sir Henry Spurrier, Chairman & Managing Director of Leyland Motors Limited. Despite the popularity of the

Leyland Atlantean double-deck bus, he points out, the public road service vehicle is meeting with increasing competition from the private motorcar, especially in Britain, where future orders may only be replacements. Overseas prospects for bus orders are bright, especially in the developing countries. A dividend is proposed of 4s. per £1 ordinary stock unit, less tax.

London Midland Region goods depots to close. British Railways, London Midland Region, has announced that Brinklow and Wyrley & Church Bridge goods depots will be closed from February 20, 1961. Brinklow, between Rugby and Nuneaton, Trent Valley, will be completely closed. Traffic will be dealt with at Coventry or Shilton. Facilities for despatching parcels traffic will also be withdrawn. Wyrley & Church Bridge, between Walsall and Cannock, will be closed except for full loads for private sidings. Other traffic will be dealt with at Walsall or Cannock.

Revised British Standards for cranes. Revised editions have been issued of two British Standards for cranes. They are: B.S.2573, "Permissible stress in cranes: Part 1: Structures," and B.S.466, "Electric overhead travelling cranes for general use in factories, workshops and warehouses." B.S.2573 has been revised as a result of experience since it was first published in 1955. The new edition is intended to form the basis for the design of all types of crane. The standard now covers many additional aspects. Among these are fluctuations of stress; basic stresses in bending for lattice

SKEFKO WINDOW DISPLAY



Current window display in the showroom of the Skefko Ball Bearing Co. Ltd., featuring British Railways new diesel Pullman services

girders and trusses; effective lengths of struts; basic shear stresses in, and minimum thickness of, web plates; and proportioning of web stiffeners. Metric versions of the tables are included as an appendix. B.S.466 also has been revised and now classifies cranes according to their intended duty. It also requires the crane structure to be designed in accordance with B.S.2573. Two innovations are that, where a rail is adequately secured to a crane girder it may now be regarded as part of the girder for load-carrying purposes; and that the maximum deflection permitted is now related to the combined weight of the safe working load and the crab. Copies may be obtained from the British Standards Institution, Sales Branch, Park Street, London, W.1. The prices are 12s. 6d. for B.S.2573, and 10s. for B.S.466.

Railway Stock Market

Stock market activity has increased, and more encouraging views about the outlook for markets have persisted, largely because of the assumption that, although fluctuations must be expected, Wall Street may move strongly ahead in the next few months. Sentiment appeared to overlook the F.B.I. warning of slowing down of orders in the home market and the growing competition in export trade. A rally in British Funds was attributed to revived talk of a reduction in the bank rate to 4½ per cent in the near future.

Canadian Pacific remained more active, moving fairly closely with the trend of Wall Street, and at \$41½ compared with \$42½ a week ago; the 4 per cent preference stock remained at 55½, while the 4 per cent debentures eased fractionally to 58½. White Pass shares, however, firmed up from \$10½ to \$10½.

Nyasaland Railways shares and 3½ per cent debentures were again respectively 9s. and 35½ with little business to test quotations. West of India Portuguese stock gained a point at 116½.

In foreign rails, Costa Rica eased from 42½ to 41½ and Chilean Northern 5 per cent first debentures from 52½ to 52.

United of Havana second-income stock was firmer at 6½, Brazil Railway bonds again quoted at 5, Sao Paulo Railway 3s. units at 10½d., and Mexican Central "A" bearer debentures changed hands around 60.

Guayaquil & Quito assented bonds were 50, compared with 50½ a week ago. Antofagasta ordinary and preference stocks remained at 16½ and 36 respectively and the 4 per cent perpetual debentures at 46½.

Main feature among shares of locomotive builders and engineers was Birmingham Wagon which were 32s. 6d. a week ago. They slumped to 21s. 3d. immediately following the shock provided by the news from the acting chairman, Mr. Frank D. O'Brien Newman, that results will show a substantial operating loss, and that it will not be possible to pay a dividend on the ordinary shares. Later the shares rallied to 27s. 6d. The outlook for the next year or two, Mr. Newman says is unfavourable, but the hopes that by the time the 1960 report is ready it may be possible to provide a less discouraging picture.

On the other hand, G. D. Peters have risen from 17s. 6d. to 20s. Beyer Peacock 5s.

shares remained at 7s. 3d., and North British Loco. at 6s. 6d., while Wagon Repairs 5s. shares strengthened from 19s. 6d. to 19s. 9d., though Gloucester Wagon 10s. shares were 6d. lower at 10s. 9d. Charles Roberts 5s. shares at 7s. were also 6d. lower compared with a week ago.

Elsewhere, some good gains have been scored, notably by Stone-Platt, which rose afresh from 61s. to 64s. after touching a new peak level of 64s. 6d. Tube Investments advanced from 75s. 6d. to 77s. 3d., and Mather & Platt from 46s. 9d. to 48s. 6d., while T. W. Ward were up to 71s. compared with 65s. a week ago, but Vickers came back on balance from 29s. to 28s. 6d. Steel shares were inclined to rally after their recent reaction, and elsewhere, Guest Keen moved 2s. higher at 89s. 3d. English Electric were better at 34s. 3d. in front of the dividend announcement. A.E.I. were 41s. and G.E.C. 32s. 3d.

Metal Industries have been prominent up to 62s. 9d., a rise of 3s. on balance. In machine tools, Alfred Herbert were 61s. 6d. Renold Chain strengthened to 34s. 9d. and G. and J. Weir 5s. shares from 16s. to 16s. 3d. Pressed Steel 5s. shares have risen afresh from 27s. 6d. to 30s. 9d., while Dowty Group 10s. shares gained 2s. on balance at 36s. 9d. Pollards Bearing 4s. shares rose from 33s. 6d. to 34s. 9d. Ransome & Marles 5s. shares held firm at 17s. 7½d.

Forthcoming Meetings

February 17 (Fri.). The Railway & Canal Historical Society, West Midlands Group, at the Engineering Centre, Stephenson Place, Birmingham 2, at 7.15 p.m. "Early Western Railroads," Mr. G. Kendall.

February 18 (Sat.). The Permanent Way Institution, East Anglia Section, at Norwich, at 2.15 p.m. "Abandoned railways in the Norwich district," Mr. R. F. Bonny.

February 18 (Sat.). The Electric Railway Society, Gloucester Section, at the Midland Royal Hotel, Gloucester, at 7.15 p.m. "Tube stock through the ages," Mr. B. J. Prigmore.

February 20 (Mon.). The Institute of Transport, Sussex Group, at the Arlington Hotel, Brighton, at 6.30 p.m. "Work study within the British Transport Commission," Mr. E. J. Larkin.

February 21 (Tue.). The Institute of Transport, Metropolitan Graduate & Student Society, at 80 Portland Place, W.1, at 6.15 p.m. "The tyre industry and transport," Mr. F. E. H. Palmer.

February 21 (Tue.). The Institute of Transport, North Western Section, at the Gas Service Centre, Manchester, at 6.15 p.m. "The Future of urban transport," Mr. D. L. Munby.

February 21 (Tue.). The Institute of Transport, Portsmouth Group, at the Chamber of Commerce, Portsmouth, at 7 p.m. "International journeys—part 2," Major D. S. Craig.

February 21 (Tue.). The Institute of Transport, Scottish Section, at the North British Hotel, Edinburgh, at 6 p.m. Paper by Mr. G. W. Stewart.

February 21 (Tue.). The Industrial Transport Association, London Division, at the Royal Society of Arts, John Adam Street, Strand, London, W.C.2, "Aspects of

transport law," Mr. T. H. Campbell Wardlaw.

February 21 (Tue.). The Institution of Locomotive Engineers, at the Institution of Mechanical Engineers, 1 Birdcage Walk, London, S.W.1, at 5.30 p.m. "The collection and assessment of technical information, including the language problem," Miss J. Ritchie and Mr. B. R. Byren. February 22 (Wed.). The Peterborough Railway Discussion Group, at the Peterborough Technical College, Eastfield Road, at 6.45 p.m. "British Transport Commission advertising," Mr. J. L. Perren.

February 23 (Thu.). The Permanent Way Institution, Nottingham & Derby Section, at the Victoria Station Hotel, Nottingham, at 6.30 p.m. "1960 Summer Convention: Ostend," Mr. M. Harbottle.

February 23 (Thu.). The Institute of Metals, at the Royal Institution, Albemarle Street, London, W.1, at 6.30 p.m. "The theory of the alloys of copper," Professor W. Hume-Rothery.

February 23 (Thu.). The Institute of Traffic Administration, Merseyside Group, at the Stork Hotel, Liverpool, at 7.30 p.m. Annual General Meeting.

February 23 (Thu.). The Institution of Electrical Engineers, at Grosvenor House, Park Lane, W.1, at 7 p.m. Annual Dinner.

February 23 (Thu.). The Institute of Transport, South West Lancashire Group, at the Town Hall, Widnes, at 6.45 p.m. Brains Trust.

February 23 (Thu.). The Institute of Transport, South Wales & Monmouthshire Section, at the Dock Manager's Office, Adelaide Street, Swansea, at 6.45 p.m. "How much art in advertising?" Mr. H. D. Muirhead.

February 24 (Fri.). The South Wales & Monmouthshire Railways & Docks Lecture & Debating Society, at Swansea, "How much art in advertising?" Mr. H. D. Muirhead.

OFFICIAL NOTICES

SENIOR WORK STUDY ASSISTANT
BRITISH RAILWAYS require for their Headquarters in Glasgow, a SENIOR WORK STUDY ASSISTANT, who should be fully trained, have a wide experience of work study applications, including incentive bonus and statistical schemes, and have good mathematical qualifications. The duties will involve being away from home as required.

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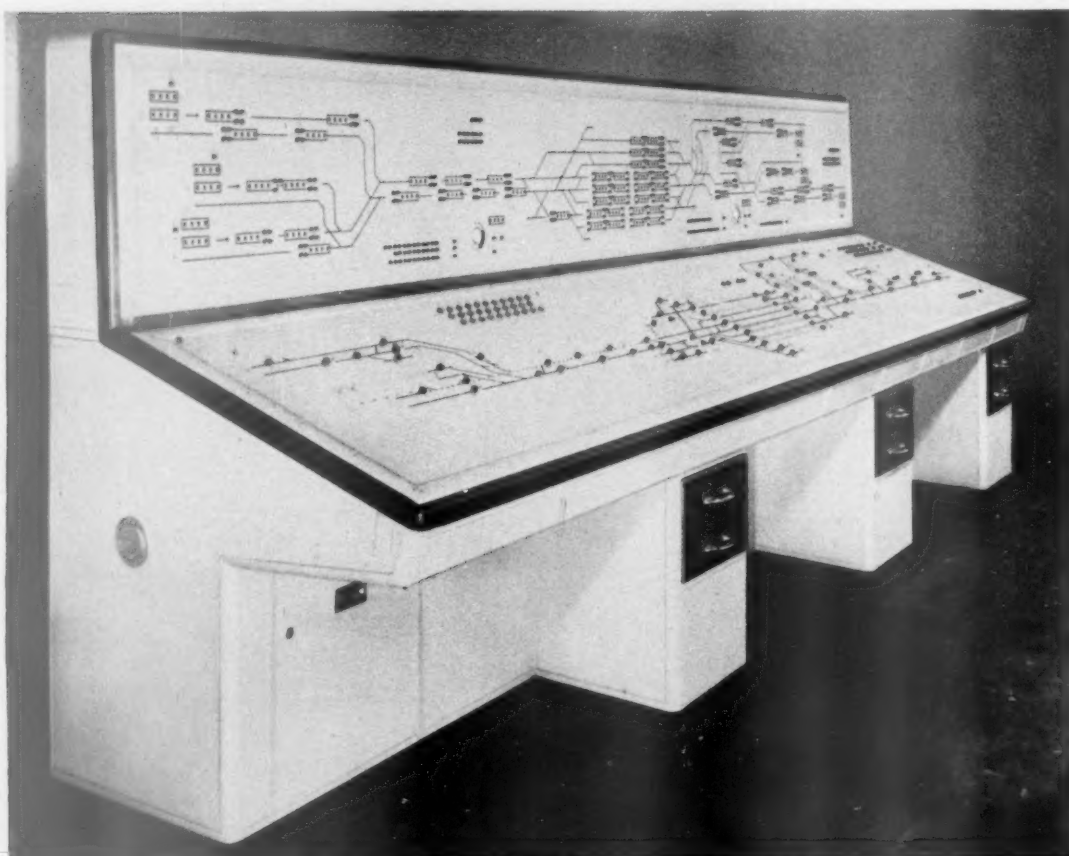
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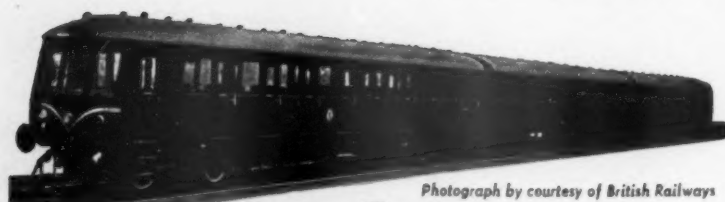


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BRITISH RAILWAYS



Photograph by courtesy of British Railways

KAYE'S

AUTOMATIC WEDGE LOCKS

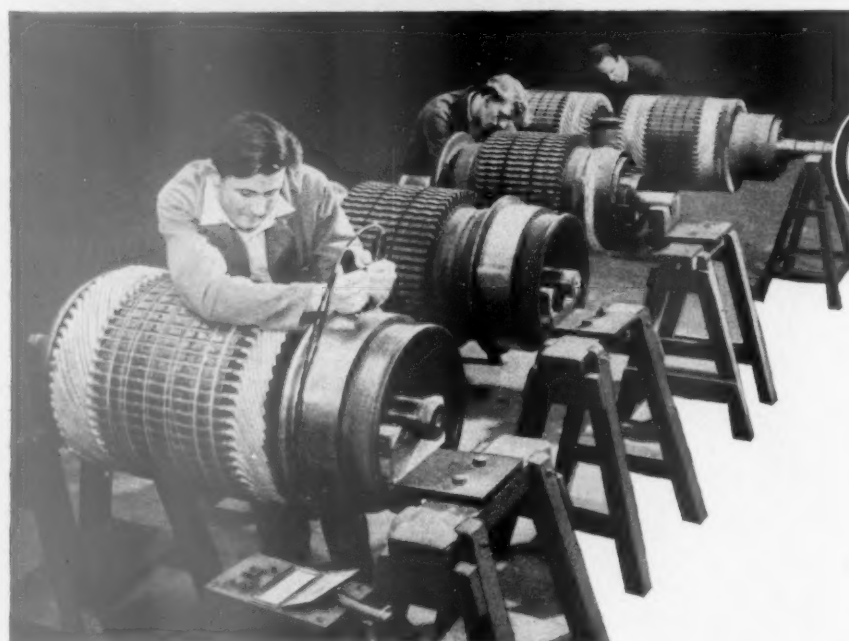
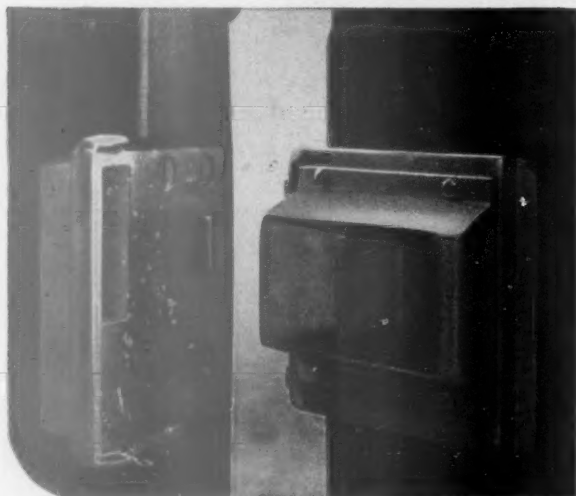
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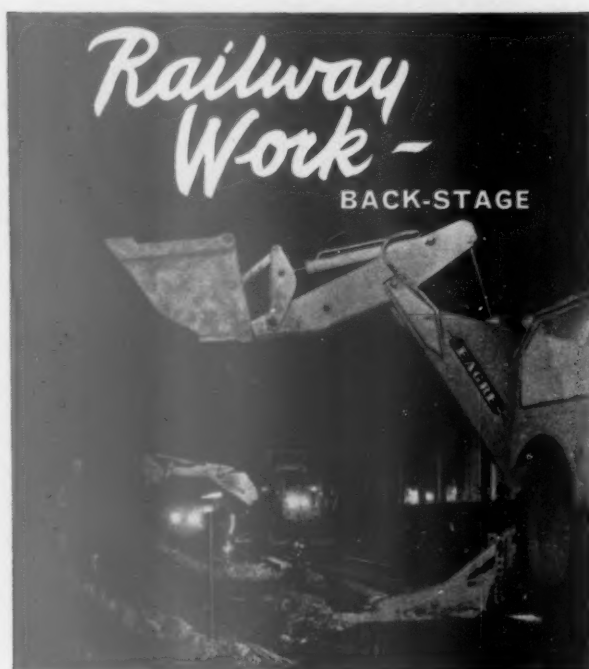
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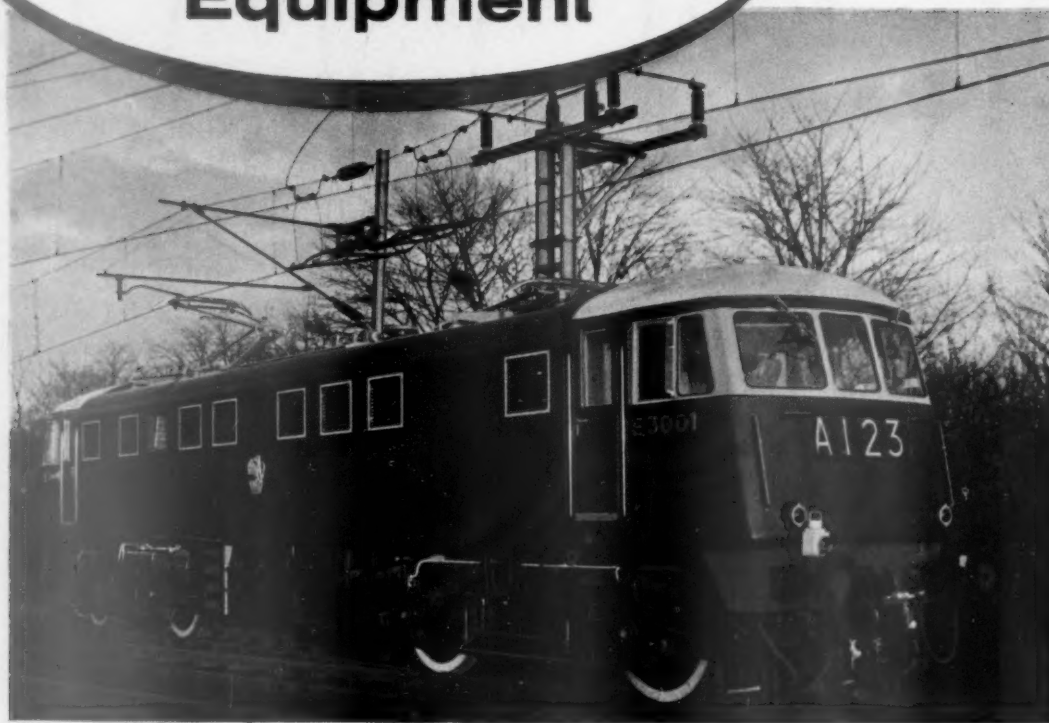
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